

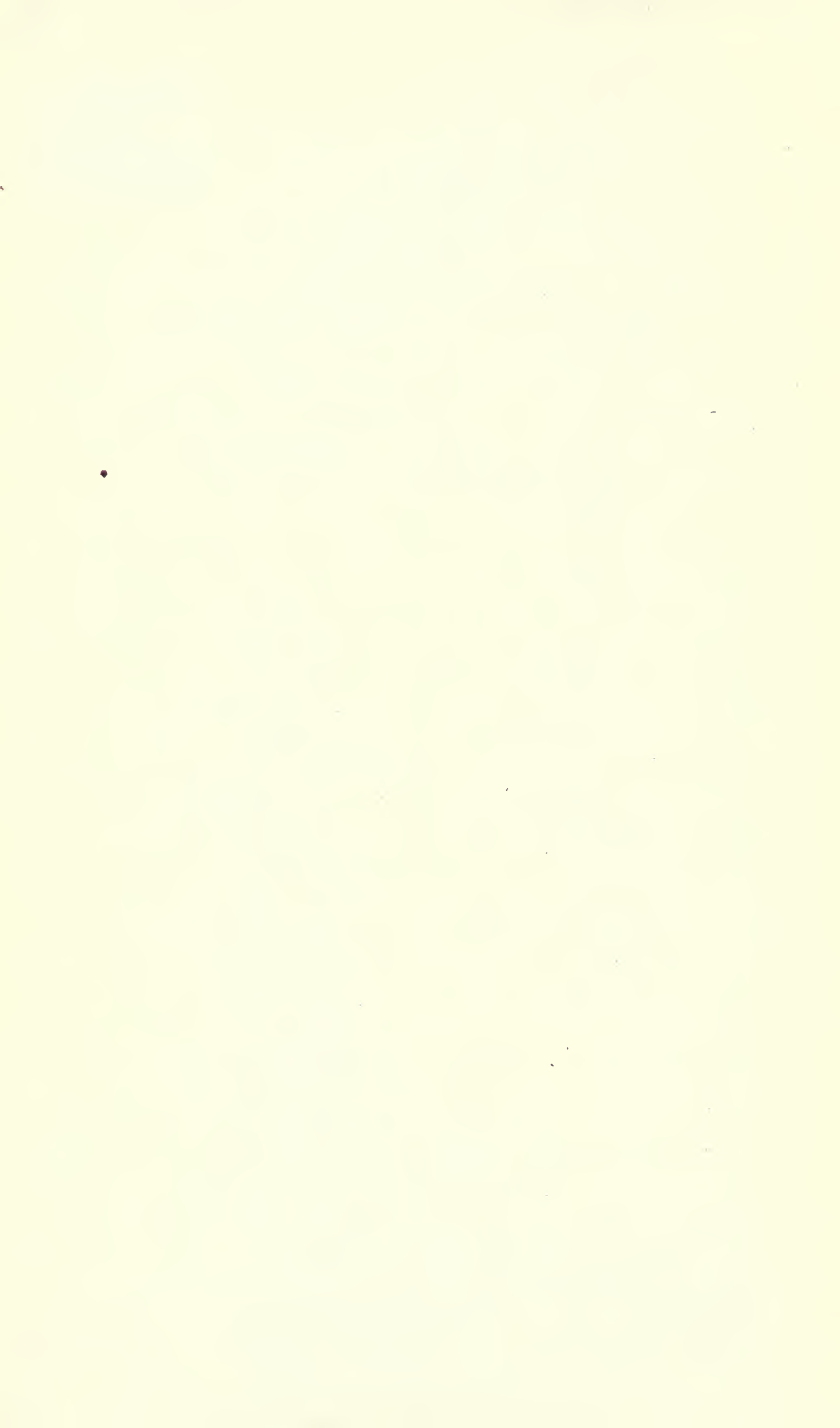
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ABORIGINAL AMERICAN HARPOONS:

A STUDY IN ETHNIC DISTRIBUTION AND
INVENTION.

BY

OTIS TUFTON MASON,

Curator, Division of Ethnology.

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THE MASTER OF THE HARPOON.
After E. W. Nelson.

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INTRODUCTION.

The aborigines of the Western Hemisphere were intimately associated with the animal world. Their methods of taking animals for their activities were as follows:

1. Gathering without devices.
2. Gathering with devices.
3. Striking, stunning, bruising.
4. Slashing with edged weapons.
5. Piercing, by stabbing, by thrusting, by hurling, or by shooting.
6. Taking in traps or blinds.
7. Hunting by means of other animals.
8. Capturing with light, fire, and smoke.
9. Overcoming by asphyxiation, poisons, and drugs.

In piercing devices the ends proposed are two, namely, to reach some vital part, and hence to kill instantly, or to insert a barb or toggle under the skin and thereby retrieve the animal. These piercing devices may be divided into three subclasses, namely: Those with a smooth blade, called lances, for stabbing; those whose blades or working part have barbs on the sides for retrieving as well as piercing, and the harpoon subclass with movable head. A harpoon is a piercing and retrieving device with a movable head. Few other inventions of savagery show better the progress of thought in devising means for overcoming difficulties than the harpoon. In order to differentiate this implement from others of the piercing type, let it be understood that the head is always set loosely on the end of a shaft, to which it is attached by means of a line. Even when shot from a bow, missiles having this structure are called harpoon arrows. Every part of the harpoon, by its dimensions and form, by its presence or absence, or by its material and attachment, lends itself to classification in the studies of progress concerning the apparatus itself and its geographic distribution.

Between the sharpened stick or bone, which wounds by piercing and which is the fundamental device of all lanceolate weapons, and the harpoon, there are one or two intermediate forms among the Eskimo usually associated with the harpoon. They may be called the hinged lance head and the detachable lance head. In the first named the ivory or bone piece, into the front of which the leaf-shaped blade is set, is at its other extremity hinged to the foreshaft, like the loose shaft of a whale harpoon. The detachable lance head has a handle or tang of wood about a foot in length and less than an inch in diameter. On the front is set a leaf-shaped or a triangular blade, and the conical base of the tang fits into a socket in the end of the heavy shaft. In some examples there is an ivory barb projecting from the handle near the blade, which is a spear characteristic, but in this instance it was designed to retrieve the lance head and not the animal. E. W. Nelson figures and describes a great variety of these.¹ He says in relation to them that they are used when the seal or walrus has been disabled so that it can not keep out of reach of its pursuers, and the hunter paddles up close alongside and strikes the animal, driving the detachable head in its entire length. The head remains in the animal, and the hunter immediately fits another point into the shaft and repeats the blow, thus inserting as many of the barbed heads as possible, until the animal is killed or the supply of points exhausted. Every hunter has his private mark cut on these points, so that, when the animal is secured, each is enabled to reclaim his own. These lances are companions of harpoons, and examples will be shown in their proper connection.

The manner of functioning with the harpoon will be considered only incidentally here, inasmuch as there is abundant literature on the subject prepared by those who have been eyewitnesses of its action (see frontispiece). For the Eskimo the student may consult Dall (1877), Holm (1887), Boas (1888), Turner (1894), Murdoch (1892), and Nelson (1899). The older writings are abundantly quoted in these, and the titles of authorities for the western Eskimo will be found in H. H. Bancroft (1874-1876). It is with pleasure here acknowledged that the careful observations of these explorers on the spot have made possible this comparative study.

PARTS OF THE HARPOON.

The fundamental or ideal parts of the harpoon are head, loose shaft, foreshaft, shaft, ice pick, line, and float. These parts rarely all coexist in a single specimen, but the Eskimo have them all on their various harpoons, while each part also takes on a multitude of forms and itself is often quite complex. Besides these fundamental parts, there are also a number of accessories, which will be considered in their places.

¹The Eskimo about Bering Strait, 1899, pp. 145-148, pl. LVII.

There are two varieties of harpoons, based on the shape of the head—the barbed and the toggle; but the former or simpler passes insensibly into the latter. Barbed harpoon heads are attached to the shaft by means of a connecting line tied to the butt or tang of the head, and may be used on animals with tough hides (see fig. 12). The toggle harpoon head is attached to its line or sling by its middle, the head is driven entirely into the animal, and toggling under the skin gives the firmest possible hold (see fig. 1). It will give the best idea of the apparatus to take up the parts of the harpoon in order, and after that to study the question of distribution.

PARTS OF THE BARBED HARPOON.

The parts of a complete barbed harpoon are barbed head, foreshaft, shaft, line, feather, and bladder (Plates 8, 9, 11, 16, 17, 18, and 19).

Barbed head.—The head of a barbed harpoon is a piece of wood, bone, antler, ivory, shell, or metal, with tooth-like projections from its margins pointing backward, so that it may pierce the hides of animals but can not be withdrawn. Its action is to ratchet and retrieve the game. The parts of a barbed head may be referred to as point, body, margins or edges, sides or faces, barbs, line hole or groove, and tang (see figs. 13, 18 and 81). As to position the barbs are unilateral or bilateral. The unilateral may be from one to many. Bilateral barbs are sagittate, alternate, or opposite. The tang is wedge-shaped, conical, or spindle-shaped, and in relation to the connecting line is roughened, notched, bulbous, or pierced.

Foreshaft.—The foreshaft of a barbed harpoon is a more or less cylindrical or pear-shaped piece of heavy material, bone or ivory, fitted on to the end of the shaft, and having a socket in front to receive the tang of the barbed head. In the rudest harpoons, such as the Fuegian, nothing of the kind exists. In some examples the foreshaft is elaborately carved in imitation of the heads of aquatic animals. The attachment of the foreshaft to the shaft is by means of a splice, a wedge-shaped tang and kerf, a socket in the shaft fitting a projection on the foreshaft, or a socket in the loose shaft fitting a projection on the shaft.¹ There is no other part of the mechanism which taxed aboriginal skill more than the joint between shaft and foreshaft. The socket in the front of the foreshaft for the tang of the barbed head has inserted in it a plug of wood having a small cavity into which the tang of the head fits loosely. The loose shaft and the shaft are bound fast together with sinew twine or fine rawhide line, the many ingenious knots appearing in the drawings (see fig. 83).

Shaft.—The shaft of a barbed harpoon is of wood, generally rigid, but of light weight. In length it varies from a few inches to many

¹ E. W. Nelson, *The Eskimo about Bering Strait*, 1899, pl. LVII b, figs. 33, 34.

feet; in thickness, from one-fourth of an inch to more than one inch. Its front end may be fitted to a foreshaft, but in the most primitive examples there is a rude split or a mere cavity dug for the tang of the barb. The manual or inner end of the shaft varies in form, being either tapering and without function, or fitted to receive the hook of a throwing stick, or notched for a bowstring, or having an ice pick of hard material securely fastened to it.¹ When not projected from a throwing stick or shot from a bow the barbed harpoon is held in or hurled from the hand. In that event hand rests or offsets are lashed to the shaft near the center of gravity.²

Connecting line.—The connecting line of a barbed harpoon at first was only a bit of string or thong uniting the head to the shaft. If there be no connecting line between head and shaft, the weapon is called a rankling arrow, because the head stays in the animal and causes death. However, the rude Fuegian inventors have gotten beyond that, for the thong is carried halfway down the shaft and made fast here and there with knots. The same happy thought is called by Murdoch an "assembling line," since it serves in case of a break in the shaft to save the pieces. In the larger harpoons and the more delicate ones the assembling line is a separate affair. The line of the more complicated barbed harpoons is fastened at one end through the line hole of the head. The other end is bifurcated, like the martingale of a bridle, or a kite string. One end of this martingale is tied to the shaft near the foreshaft, the other near the butt end of the shaft. When the harpoon is ready to be hurled the line is neatly rolled on the shaft, the head is placed in its socket, and a slipknot around the shaft takes the slack in the line. When the game is struck the head is pulled from its socket, the slipknot is released, and the line unrolls. The foreshaft being of bone, drops lowest in the water, so that the shaft acts as a drag. It serves also as a buoy, since the upper end, especially when feathered, bobs about over the water and shows the position of the game.

The feathering of the barbed harpoon is that of the arrow. Looking at this characteristic from the southward, the occurrence of feathers on the shafts of harpoons in lower Bering Sea is not abnormal. The float of the barbed harpoon is a small inflated bladder, stomach, or intestine attached to the side of the shaft, helping to keep the latter erect in the water. These structural elements are much more highly developed in the toggle series now to be studied. The barbed harpoon is of especial interest to the archæologist, who finds heads of bone or antler with holes and knobs or grooves for attaching the connecting line and every variety of barb, in both shell heaps and cemeteries throughout Canada and the United States.

¹ The Eskimo about Bering Strait, 1899, pl. LIV and LV.

² Idem., pl. XLVII b, figs. 31-32.

PARTS OF THE TOGGLE HARPOON.

Toggle head.—In describing a toggle harpoon head it is necessary to orient it, not that the Eskimo is known to have held any portion of the apparatus uppermost habitually, but for the sake of convenience in comparing different types and styles. However, Captain Herendeen informs the author that so far as his personal observation goes the barb of a toggle harpoon head, like the cock feather in an arrow, is held uppermost. (See fig. 1.)

To orient a toggle it must be placed with the barb or spur at the rear end uppermost, the point away from the observer. It will then be possible to speak of the top, back, or upper side; of the bottom, belly, or under side; of the right margin and the left margin; of the front or point; and of the butt end or rear. In those large examples, wherein there are right and left barbs in the rear, with the blade in the plane of the widest diameter of the body (Cat. Nos. 45947, 63948, 53950, figs. 34–50), the top may be distinguished from the bottom by means of the line hole, which runs in a bent course through the body.

The parts of a toggle head have been discussed by Mr. John Murdock.¹

When the toggle head is oriented it will be seen that it is possible to speak of the following parts: Body, blade, blade slit or kerf, line hole, line grooves, barbs (side and rear), socket for loose shaft, butt or rear end of the body, loose shaft, blade line, loose-shaft loop or running loop, head line or leader, ornamentations, and owner marks. Each one of these parts should be described and even its absence noted. The characteristics of these parts are as follows:

Body.—Its material, shape in outline and section, and dimensions.

Blade.—Its material, shape, relation to the body, whether a part of it or not; orientation, whether vertical or horizontal in the plane parallel with the line hole or across it.

Blade slit or kerf.—Whether saw cut or coarse; its orientation. The blade cover is frequently a case or cover for the entire toggle head.

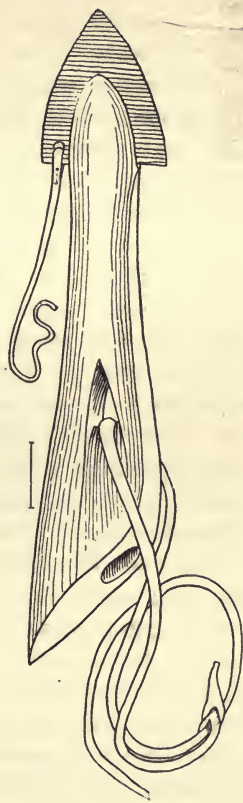


Fig. 1.
TYPE FORM OF TOGGLE HEAD.
Hudson Bay.
Collected by Ludwig Kumlien.
Cat. No. 25654, U.S.N.M.

¹ Ninth Annual Report of the Bureau of Ethnology.

Line hole.—The opening through the body of the toggle head for the rawhide sling or leader on which the toggle head hinges. In very modern examples and in the heads of small seal harpoons the hole is bored straight through, but in old specimens two much coarser holes are bored, one from each side of the belly inward and upward, meeting midway. All sharp edges within and without are carefully smoothed and rounded to protect the line and to facilitate the toggling. The points to be considered concerning the line hole are the shape, size, and method of boring, and its position with reference to the other parts of the toggle head. Line holes run directly through the narrow body type, but in a curved path through the belly of other types. In a few abnormal specimens it stands vertical, but in the great majority of examples it goes horizontally across the body. Holm figures toggle heads from east Greenland, in which the head is hinged to the foreshaft by means of a rivet.

Line grooves.—Gutters or channels extending backward from the line hole in which the rawhide line lies out of the way. In fact the line grooves are backward extensions of the line hole. Their width and depth have relation to the width and thickness of the rawhide line used. In old specimens they are wider and clumsier.

Barb or spur.—The projection backward in a toggle head at its butt end has for its function to catch into the flesh of the animal beneath the skin, so as to revolve the head ninety degrees, and thus to effect the toggling of the head in the wound, as in the fastening of a trace chain. In its way it is as important as the blade, and it will be seen that quite as much ingenuity has been spent on this part as on any other. If, for example, when the animal is struck, the spurs of the rear barb were covered by the rawhide line the head might not toggle; hence, in a toggle head of the old-fashioned type the line hole lies below the center of the mass. The entire projection of the toggle head back of the line hole may be called the spur to distinguish it from marginal barbs also sometimes present.

Shaft socket.—The socket is a conoidal excavation in the butt end of a toggle head, into which the forward end of the shaft or loose shaft fits loosely. It will be readily understood that the socket is centered as exactly as possible. There is little or no variation in this part except of size and neatness. When the toggle head has been thrust into a beast the foreshaft or the loose shaft must be withdrawn in order to allow the weapon to do its work.

Butt.—The butt or rear end of a toggle head is shaped in relation to the barb especially and also to the socket. In fact, the upper portion of the butt end is a part of the barb or spur. The exact method of shaping and treating this part seems to depend largely on the material, whether ivory, antler, or bone. The first named is solid, and the butt is acute angled above and sawed off square below. The other

materials have more or less of spongy core or are hollow. In such examples the butt is mitered off with the acute angle at the barbs, and then scooped out and dished about the socket.

Blade line.—This is wanting in a great many examples. It is a little twine of sinew extending from the inner left-hand corner of the blade, where it is looped into a small perforation, backward to the first wrapping of the leather sling or leader.

Leader or sling.—The toggle sling is a loop of rawhide thong or sinew twine, a foot, more or less, in length, passing through the line hole of the toggle head at one end and at the other end attached to the main line by means of a splice, toggle, or clasp, to be described later. The two ends of this sling are spliced or joined after the neatest and most elaborate Eskimo styles. At one or more points the two sides of the loop are carefully united by wrapping (fig. 83). In the collections of the U. S. National Museum the smaller harpoon heads with leaders are accompanied with sticks of pine wood on which the apparatus is kept stretched when not in action (fig. 84). In the great harpoons, as will be learned in the description of the line, there is no leader or sling to the toggle head, which is hinged at once onto a bend in the end of the main line. Without the hinging line the movable head is only a rankling device. For instance, the loose head of many South American arrows, formed of a socketed bone of a monkey, remains in the wound, but not being attached to a line for retrieving it is not a harpoon head. The step between the two, however, is but a short one.

Loose shaft.—The part of a toggle harpoon which, at its forward end, fits into the socket of the head and in some way is hinged or joined to the foreshaft at its hinder end, as seen in figs. 2, 48, is called the loose shaft. The two varieties are the spindle-shaped and the conoidal. The former is joined on to the leader or sling of the toggle head by a running loop or grommet (fig. 83); the latter is strapped to the end of the shaft by a rawhide thong, and makes a ball-and-socket joint (fig. 49). In either case the body of the loose shaft is perforated with one or more holes. When the toggle head is in place on the loose shaft the line is drawn taut, so that the loop or bone eyelet on the line may be buttoned over its peg on the shaft (fig. 79).

Writers on the Eskimo harpoon say that the kneejoint between the loose shaft and the foreshaft is to prevent the accidental breaking of the shaft. Captain Spicer gives additional functions to this structure of the implement. He says that it aids in the shipping and unshipping of the toggle head with reference to the loose shaft after the eyelet on the line is over its peg on the shaft. When an Eskimo hunter would prepare his harpoon for striking, he puts the eyelet which is attached to the line over the peg on the shaft, sets the loose shaft at an angle in the socket of the shaft, puts the toggle head in position, and

straightens up the loose shaft. This brings all taut for the stroke. As soon as the game is struck the shaft is pulled to one side by the movements of the animal, the loose shaft comes out of its socket and detaches itself from the toggle head. This enables the hunter to pull away his shaft easily and instantly.

Foreshaft.—The foreshaft of a harpoon is the working end of the shaft, and is usually a block of bone or ivory neatly fitted on. Fore-

shafts vary in material, being of antler, bone, ivory, or metal; in size and shape, from the delicate front of the sea-otter harpoon to the clumsy variety on the Greenland whaling harpoon; in the mode of attachment to the shaft, in the socket, and lashing for the loose shaft (see Plates 6, 8, 9, 10, 12, 15, and 18).

Shaft.—The shaft of the harpoon is of wood; in treeless areas, of driftwood, but in the north Pacific it is a long, slender pole of cedar. For the purpose of study, shafts have to be considered in relation to materials, shapes, and sizes; to hand stops or rests for thrusting; to line pegs, throwing stick pegs, assembling line, etc. For catching sea-otter the dart shaft is half an inch in diameter and 4 feet long, while some of the clumsy Greenland examples are 2 or 3 inches in diameter, and the east Greenland deep-water variety and sled variety for killing on the ice at a distance have shafts many feet in length, requiring two men to work them.



Fig. 2.

LOOSE SHAFTS OF TOGGLE HARPOONS.

Cumberland Sound.

Collected by Ludwig Kumlén and Lucien Turner.

Cat. Nos. 90165, 2991, 34098, 34063.

After Franz Boas.

The shaft has the double function of stabbing and retrieving. For the former (1) it may be thrust at the victim, in which case, in order to give a firmer grasp, a projecting piece of wood or bone or ivory is fastened near the center of gravity to stop the hand. Near this is frequently found a peg, over which is hooked the line to hold the head firmly on to the loose shaft. (2) It may be thrown as a javelin from the hands. (3) It may be hurled from a throwing stick. This method will be more fully described in a

special paper. The series begins with the plain shaft, and includes the hand-rest type, the throwing stick type, the Giliak long pole and floating-head type, the east Greenland sled-point type, the east Greenland deep-sea shaft type, and the Amazon type, in which the throwing stick is cast overboard.

By the function of retrieving is meant recovering the game after it has been struck. For this purpose the shaft is in many cases thrown overboard, and, being attached by one end of the line, while the other is tied to the harpoon head in the animal, acts as a drag and a buoy to impede the progress of the animal and to show its position.

Ice pick.—On the butt end of the harpoon shaft may be found, in arctic examples, a long ivory pick for enlarging a hole in the ice in order to remove the game. This is replaced with a boat-hook arrangement in others. Types of the butt end of the shaft exist in the forms following:

1. The plain butt, without function.
2. The feathered end, akin to the arrow.
3. The socketed end, for throwing stick.
4. The Greenland type, with ivory feathering.
5. The pick.
6. The carved pick, Nunivak type, on lances with loose heads.

Nansen¹ traces the elaborate Greenland harpoon shaft, with its many accessories, thus:

1. The Indian arrow, with its variety of feathering.
2. The feathered harpoon darts in southeastern Alaska.
3. Farther north the disappearance of the feather and the occurrence of the small bladder on the shaft.
4. The harpoon, with line and skin float, the last named being detached from the shaft and attached to the head.

Line.—The line of the harpoon also has had its peculiar elaboration, answering to external exigencies and opportunities on the one hand, and to the ingenuity of the savage on the other. The Fuegian sinew thread, a few inches long, is far away from the Greenland whale line, and a series would take some such order as the following:

1. The Fuegian type, short sinew cord tied around both the head and the shaft.
2. The western Eskimo type, line tied to head and middle of shaft.
3. Martingale type, attached to shaft in two places.
4. With skin float, head fastened to line.
5. Entirely separate, with ivory or bone toggles for fastening to the leader strap of the head and to the float.

The harpoon line developed a deal of ingenuity in the textile art. Shredded sinew, thread, twine, and braid or sennit are in demand constantly. Rawhide line in great variety is also a necessity.

¹ Across Greenland, London, 1890, II, p. 260.

Here also originated the whole scheme of knots and splices, as will be abundantly shown in the illustrations that follow. The Eskimo made a button or frog on the end of a rawhide line by cutting a slit near the end and doubling the end back through the slit. They were extremely neat and skillful in fastening off lashings. Boas and Murdoch have given special attention to the Eskimo knots.

With the line, in its highest estate, go certain accessories, such as the eyelet, for making fast to a peg on the shaft (fig. 3), the line rack on the kaiak, and a multitude of ingenious inventions which Nelson calls "detachers," since they make it possible in the frozen Arctic for the hunter to take his apparatus apart under the most trying circumstances.

In order to prevent the line from getting out of order, a swivel is sometimes used. One brought from Cumberland Sound by Kumlien and described by him is represented in fig. 4. There was a ball in the hollow body of this instrument, which could not be pulled through any of the openings. One line was fastened to this ball, passing through the central hole, and another one to the top of the swivel. A simpler pattern

is represented by Boas,¹ in which the ball in the socket would be a spherical knot on the end of the line.

Floats.—The sealskin bag used as a float on the end of the line of the harpoon for killing whale and beluga is in Unaleet *āgaū ūk*, bag; in Malemut *Āygt nūk*; the float, in both dialects, is *Ōā tuk*. Nelson describes two sizes. The smaller one is fastened to the line after the beluga has become unable to struggle much. The large float which has tired the beluga is at the end of the line. This small one is gradually slipped nearer by the man in the kaiak until it is distant 4 or 5 feet, when the *coup* is made and the prey secured. Boas describes and figures examples from Cumberland Sound (figs. 5, 6).

By far the largest floats in the U. S. National Museum collection are those of the Aht or Nutka whalers off Vancouver Island. The skin of a seal is taken off whole, making a float 3 feet long and 2 feet wide.

Line rack.—Of the rack on the kaiak in front of the hunter (Unaleet, *Achal ook*; Malemut, *A shal odk*) for holding the rawhide line, Nelson



Fig. 3.

EYELET ON HARPOON LINE.
Cumberland Sound.
Collected by Ludwig Kumlien.
Cat. No. 34123, U.S.N.M.
After Franz Boas.



Fig. 4.

LINE SWIVEL.
Cumberland Sound.
Collected by Ludwig Kumlien.
Cat. No. 34121, U.S.N.M.
After Franz Boas.

¹Sixth Annual Report of the Bureau of Ethnology, p. 481.

says that the line is coiled on it with harpoon attached to one end and the large float to the other end, and lightly fastened back of the hunter. When the line has nearly run out the float is thrown overboard. The rack is fastened to the kaiak with grass strings, so that, should the line

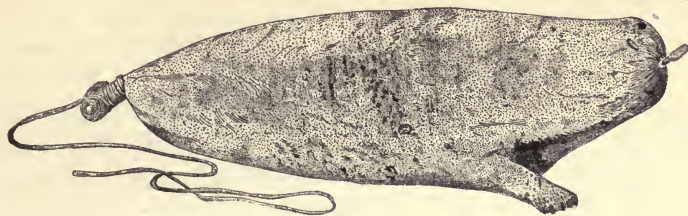


Fig. 5.

SEALSKIN FLOAT.
Cumberland Sound.

Collected by W. A. Mintzer. Cat. No. 30009, U.S.N.M.
After Franz Boas.

become entangled, the rack would be easily torn away without upsetting the craft. (Plate 14.) It would then act as an impediment to the progress of the animal.

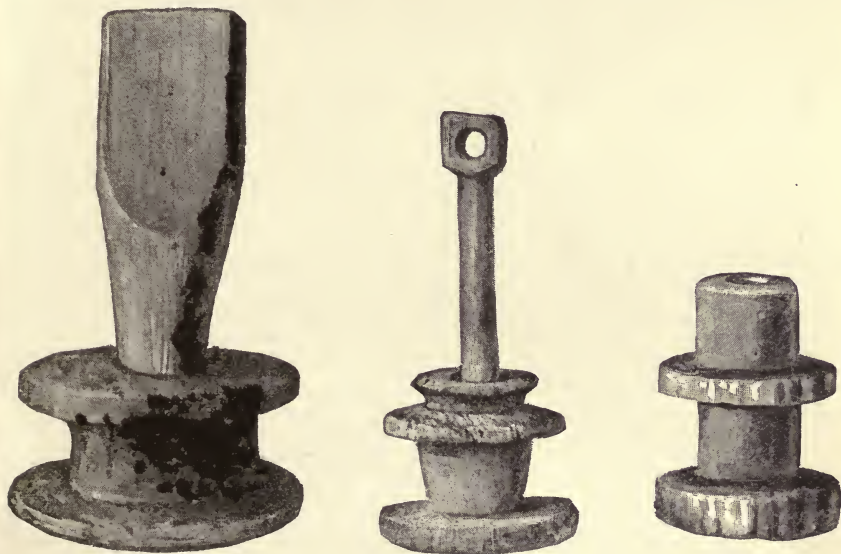


Fig. 6.

MOUTHPIECES TO FLOATS.
Cumberland Sound.

Collected by W. A. Mintzer and Ludwig Kumlien. Cat. Nos. 29986, 34118, 34119, 34120, U.S.N.M.
After Franz Boas.

In the accompanying plate (after Nelson) will be seen a great number of harpoon parts just mentioned. (Plate 1.)

16125. Small toggle harpoon head with stone blade and leader of rawhide done up on a short piece of wood. The cap belonging to this head is shown above. Nunivak Island. William H. Dall.

33465. Finger rest for harpoon, triangular in form and ornamented with a carving of a seal in low relief. Fastened on to a shaft by means of a lashing through three perforations. St. Michael. E. W. Nelson.
33632. Toggle head of a walrus harpoon of late pattern, since the carving is mechanical in outline. Norton Sound. E. W. Nelson.
33641. Finger rest for harpoon shaft in form of a bird's beak, fastened on to the shaft by a lashing through three perforations. Norton Sound. E. W. Nelson.
36097. Foreshaft of seal harpoon, cylindrical in form, showing wedge-shaped notch and the method of attachment to the end of the wooden shaft. Big Lake. E. W. Nelson.
37377. Toggle head of a walrus harpoon with stone blade, showing the method in which the leader of rawhide is attached to the loose shaft by means of sinew thread. Chalitmut. E. W. Nelson.
37417. Foreshaft of bone carved in shape of an animal's head and showing the method of attaching the foreshaft to the wooden shaft. Anagogmut. E. W. Nelson.
37671. Finger rest of bone, with triangular perforations for lashing to the wooden shaft. Kongigumogumut. E. W. Nelson.
38529. Slate blade of harpoon head. Lower Yukon. E. W. Nelson.
43461. Bone head of barbed harpoon for seals. Tang, wedge shaped; line hole, oblong; four barbs, all on one side. St. Michael. E. W. Nelson.
43865. Finger rest for large seal spears. In form of a seal's head; hole for lashing, triangular. Unalakleet. E. W. Nelson.
44077. Barbed head of large seal harpoon. Tang, wedge shaped; hole, circular; barbs, three on one side and two on the other. Mouth of Koyuk River. E. W. Nelson.
44405. Ice pick of ivory for end of large harpoon. Fastened by lashings through four perforations. Cape Nome. E. W. Nelson.
44421. Barbed head for seal harpoon. Line hole, oblong; barbs, two on one side and one on the other. Cape Nome. E. W. Nelson.
44699. Toggle head of seal or walrus harpoon, complete, with slate blade. Sledge Island. E. W. Nelson.
44703. Loose shaft of seal and walrus harpoon. Butt squared off and having a small spindle-shaped projection fitting in a socket on the top of the foreshaft. Sledge Island. E. W. Nelson.
44746. Iron head of seal and walrus harpoon. Sledge Island. E. W. Nelson.
44812. Finger rest for large harpoon. Sledge Island. E. W. Nelson.
45170. Finger rest for large harpoon. Sledge Island. E. W. Nelson.
45171. Finger rest for large harpoon. Sledge Island. E. W. Nelson.
45173. Cord fastener for large harpoon. Sledge Island. E. W. Nelson.
48276. Barbed head for harpoon. Nunivak Island. E. W. Nelson.
48293. Finger rest for large spear. In shape of a boat's rudder, set on by lashings around the shaft through three perforations in the rest. Nunivak Island. E. W. Nelson.
48471. Toggle head for harpoon (toy). Kegiktoiwik. E. W. Nelson.
48820. Slate blade of toggle harpoon head. Rasbonisky. F. W. Nelson.
63334. Old barbed and toggle head, for seal, combined, showing the method of providing shaft socket by lashing. St. Lawrence. E. W. Nelson.
63497. Foreshaft of barbed harpoon for seals. It fits into a wedge-shaped notch in the end of the shaft. St. Lawrence. E. W. Nelson.
63842. Finger rest. Head and neck of seal carved out from the material, probably antler. Attached by lashing to the thin, graft-like portion to the shaft. Point Hope. E. W. Nelson.
63843. Finger rest, Point Hope. E. W. Nelson.
63844. Finger rest, Point Hope. E. W. Nelson.
126812. Ice pick for harpoon. St. Lawrence. E. W. Nelson.



ACCESSORIES TO THE HARPOON.

ACCESSORIES TO THE HARPOON.

Besides the hundred and one parts of the harpoon immediately attached to it there are unlimited accessories which have been called into existence at its demands. The hunter has a peculiar costume which he puts on when he goes harpooning. Certain kinds of food are demanded; a multitude of charms and lore are inseparable from the implement. In addition, the hunter takes along several devices to gain information, to decoy the game, and to add to his own comfort. All about the American coast where great fish or mammals existed the water craft were improved immensely. The Nutka dug-out canoes and the Eskimo kiaiak are unrivaled, and they are the ministers of the harpoon. In like manner the sled, the dog, the harness, the shifting tent owe their forms and usefulness to the ingenious mind which devised and perfected the harpoon, which is no doubt the most virile of all savage inventions.

Sometimes a small implement is used in the hunt to indicate the approach of the seal. It is called qipekutang, and consists of a very thin

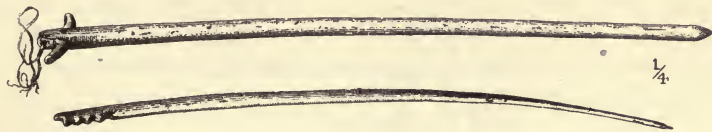


Fig. 7.

SEAL INDICATORS.

Point Barrow, Alaska.

Collected by P. H. Ray. Cat. No. 56507. U.S.N.M.

After John Murdoch.

rod with a knob or a knot at one end.¹ It is stuck through the snow, the end passing into the water, the knob resting on the snow. As soon as the seal rises to blow, it strikes the rod, which, by its movements, warns the hunter. Generally it is made of whale's bone. Sometimes a string is attached to the knob and fastened by a pin to the snow, as its movements are more easily detected than those of the knob. The natives are somewhat averse to using this implement, as it frequently scares the seals.²

When watching for a seal at his breathing hole, the Point Barrow native inserts into the hole a rod of ivory. When the seal rises, it pushes up this rod and thus warns the hunter when to shoot or to harpoon³ (fig. 7).

The sealing stool is a small triangular plank with three short legs, on which a hunter squats when watching at a seal hole, where fre-

¹ Parry, Second Voyage, II, p. 550, fig. 20.

² Sixth Annual Report of the Bureau of Ethnology, p. 478.

³ Murdoch, Point Barrow Expedition, p. 255, fig. 255.

quently he has to stand for hours motionless on the ice.¹ Murdoch

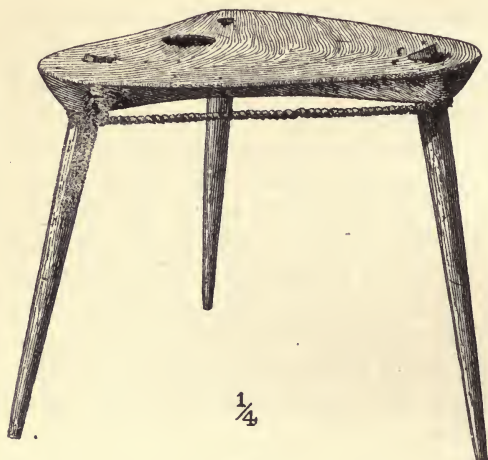


Fig. 8.
SEALING STOOL.
Point Barrow, Alaska.

Collected by P. H. Ray. Cat. No. 89887, U.S.N.M.
After John Murdoch.

makes the important statement that this device is not found elsewhere save at the Mackenzie mouth and in arctic Alaska (Robert MacFarlane's notes). Egede describes and figures a "sort of one-legged chair and a footstool." Also Cranz (fig. 81).

Cat. No. 38754 (fig. 9) is an apparatus for joining the two parts of a harpoon line; it may be the leader attached to the line hole through the head or it may be on an extra line used to lengthen the distance between the head

and the float. A collection of these from different areas would form an interesting study. The extreme cold of the region, stiffening the line and freezing the hands of the fisherman, makes it necessary to have some device which renders the rapid shipping and unshipping of the line certain and easy. In the example here shown the detacher is carved in the shape of a seal's head. The leader passes through the hole drilled in the neck of the animal, while the line to be attached is looped and pushed through the mouth of the seal, around a stud on top of the head, and hooked. While this attachment is secure enough where there is a steady strain, the hunter has only to push the loop backward, when it relieves itself from the button or stud and can easily be withdrawn. Especial attention is called in this example to the neatness with which the frapping is done on the rawhide thongs, the whale carved on the under side of the

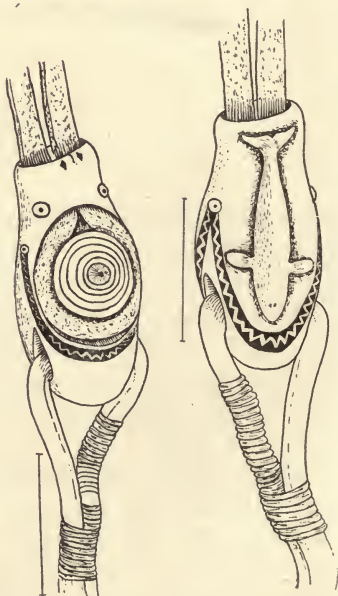


Fig. 9.

LINE DETACHER.
St. Michael, Alaska.

Collected by E. W. Nelson. Cat. No. 38754,
U.S.N.M.

¹ Point Barrow Expedition, 1892, p. 255, fig. 256.

object, the curved line or serrate ornament, the owner mark on the back of the head, and the existence of the dot and circle ornament for eyes and on the button or side.

Figures 40 and 41, pages 144 and 145, in Nelson (1900), are good illustrations of this type.

Cat. No. 45060 (fig. 10) in the U. S. National Museum is a seal decoy from Sledge Island, collected by E. W. Nelson. It consists of a handle of pine wood rudely carved at the butt end to resemble the face of a seal, and at the other end into three prongs. Upon each one of these prongs is fitted a toe of a seal so that the three points will touch the same surface. Around each of these is wrapped, by half hitches, a continuous thread of sinew and loops passing around a jog or projection on the end of a stud in the handle just where it is pronged. This stud, of walrus ivory, has carved at the other extremity the head of a seal, the eyes, ears, and nostrils indicated by insertions of black substance like whale-bone. The use of this, it is said by those who have traveled in Alaska, is to scratch upon the ice in order to imitate the noise made by the male seal and thereby attract his mate. On hearing the noise above, the seal that is under the ice comes to the breathing hole and is soon dispatched by the hunter.

The ice scoop, an accessory to the harpoon, found all over the arctic regions, is shown in fig. 11, *a* and *b*. The first example, fig. 11*a*, is from the Amur region; 11*b* shows a similar device from Cape Nome, Alaska, south of Bering Strait. After the seal is struck with the harpoon down through the small breathing hole, it is necessary to enlarge the opening in order to withdraw the body of the animal. This is done with the pick on the butt end of the harpoon. As soon as the opening is large enough the hunter proceeds to remove the broken ice at once by means of a scoop, the essential parts of which are the handle, the bow, and the webbing. In the example from Schrenk here figured the very primitive way of attaching the spoon to the handle is worthy of notice. The spoon is kite-

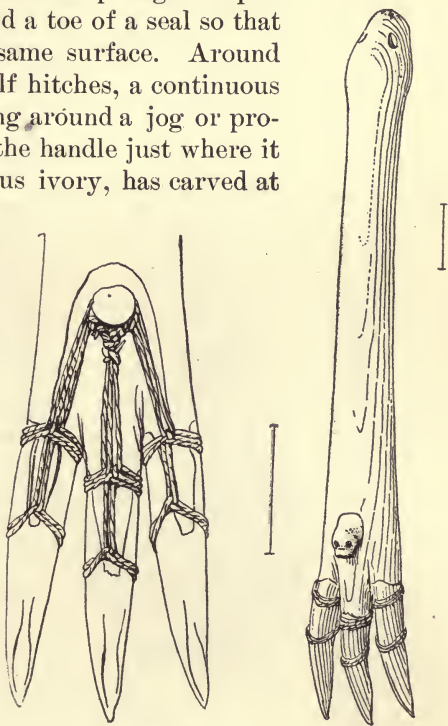


Fig. 10.

DECOY FOR SEAL.

Sledge Island, Alaska.

Collected by E. W. Nelson. Cat. No. 45060, U.S.N.M.

shaped in form, the butt ends crossing and lashed to the handle a little above the lower ends, which rest underneath a short bit of wood or across the spoon at either end by means of a rawhide thong. The examples of this apparatus are figured in Nelson, Murdoch, and Boas.

Among the accessories to the harpoon, the throwing stick or board, called *atlatl* by the Mexicans, must not be omitted. True, the cun-

ning device was used all around the Pacific Ocean and across the Arctic for projecting spears as well as harpoons, and there are other methods of using the harpoon effectively; but the elaboration of the *atlatl* throughout was greatly stimulated by association with the harpoon. The proper discussion and illustration of this accessory, however, would far exceed the limitations of this article, and will therefore be reserved for a separate paper. A map showing the distribution of the *atlatl* in the Western Hemisphere would be marked on Greenland, Labrador, Baffin Land, Mackenzie River, all about Alaska to British Columbia, Santa Barbara, cliff dwellings of the Colorado, throughout Mexico, Central America, Florida, Colombia, the Orinoco, and the Amazon on several of its great tributaries, especially in the Mato Grosso.

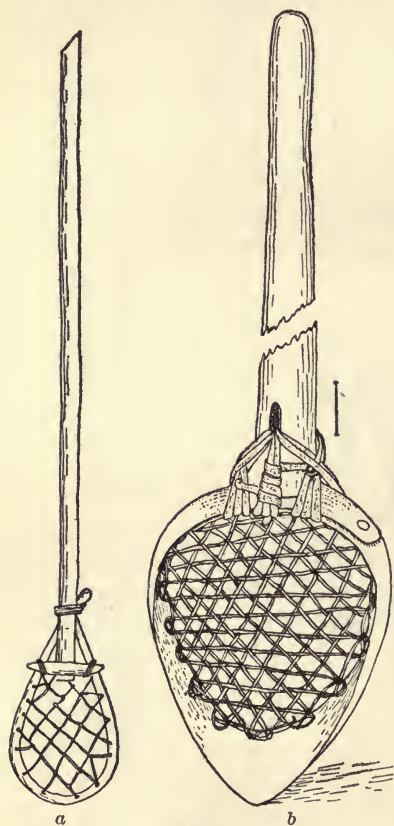


Fig. 11.
ICE SCOOPS.

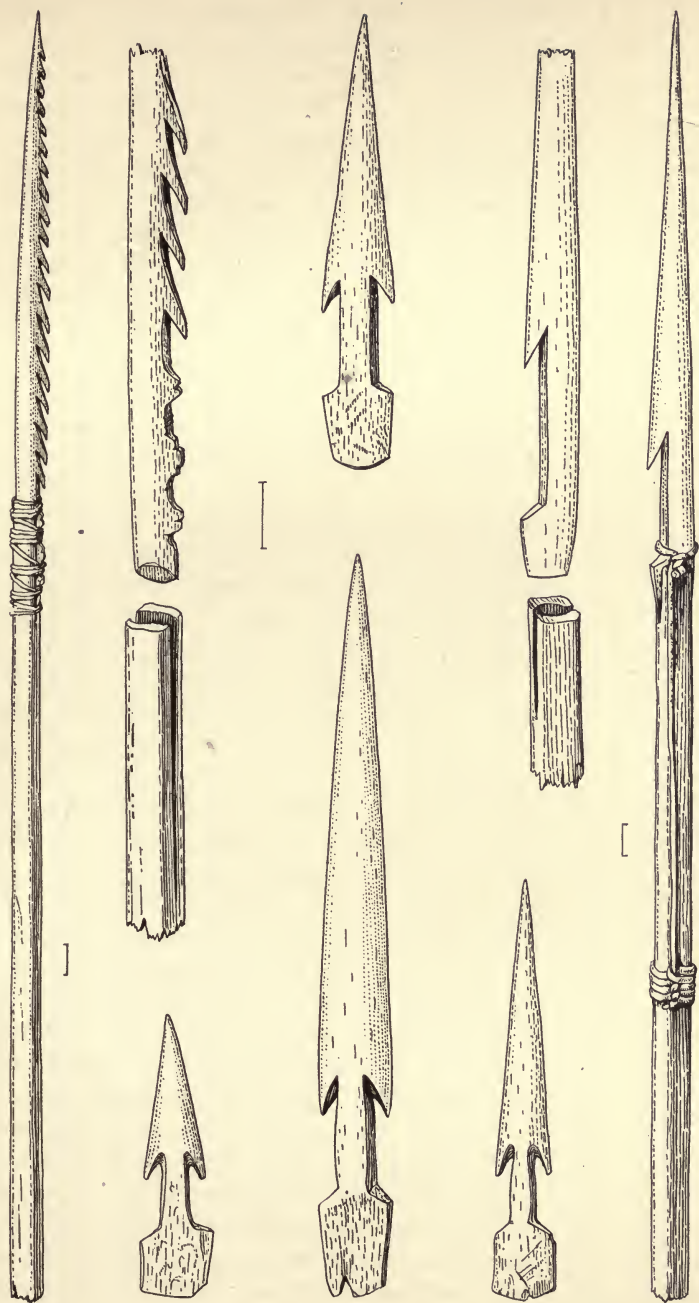
Amur River and Bristol Bay.

Collected by E. W. Nelson; *a*, after Schrenk; *b*, Cat.
No. 45409, U.S.N.M.

SOUTH AMERICAN HARPOONS.

The continent of South America was not favorable to the harpoon. Most of its shores descend at once into the inhospitable deep sea. Ex-

cept at its narrow and bleak coast southward, animals best captured with the harpoon did not abound. Inland there were pampas and forests, better suited to bolas, spears, slings, blow tubes, and the bow. It is in the Straits of Magellan, on the west coast, and in the open waters of the great rivers that a rude barbed harpoon and excellent harpoon arrows existed. Nor can the thought be slighted that outside of the favored Cordilleras, the luxuriance of nature overpowered the inventive faculty, which indeed is developed among difficulties so long



FUEGIAN BARBED HARPOON HEADS.

Collected by United States Fish Commission steamer Albatross.

Cat. Nos. 127566, 131217, 131218, 178805, U.S.N.M.

as there is hope, but gives way to despair when nature even by her riches shuts the door against invention. This part of the South American Indian's equipment was not of a high order, since his patent which he received for his cunning was so meager.

Fuegian type.—About the Straits of Magellan are three linguistic families of Indians—the Onan, the Alikulufan, and the Yahgan. The first named are believed to be closely related to their neighbors, the Patagonians of the mainland. The other two families make canoes of bark and live on sea products. Their inventions, aside from their ingenious canoes, are not of a high order. Since the days of Magellan, 1520, until now, they have been spectators of Caucasian activities, yet they adhere to their ancient forms and are among the lowliest of the tribes now on the earth.

In the Fuegian barbed harpoons the transition from the spear is immediate, for it is only a matter of a short piece of sinew string or leather thong uniting the head with the shaft. If the barbed head of bone be firmly fixed in the split end of the shaft, the implement is a spear; if the barbed head fit loosely by its butt into a socket or, what is really the case, into the riven end of the shaft, and is joined to the shaft by a short cord or thong, as is shown in fig. 12 (Cat. No. 79091, U.S.N.M.), the implement is the most primitive of harpoons. The transition is not only immediate but easy. When the end of the shaft is merely split to hold the tang of the long bone spearhead, it is impossible to make a rigid joint by any amount of wrapping.

In the examples studied for this paragraph, collected by the U. S. Fish Commission steamer *Albatross*, the spearheads have many serrate barbs on one edge of the blade, and the tangs, instead of being smooth and tapering, are roughly notched to prevent the head from being drawn out of the end of the shaft (Plate 2). In like manner the harpoon heads of bone have tapering points of greater or less length, with two large barbs, one on each side, or one barb projecting near the base. In spears the tang is not fitted neatly into a socket at the end of the shaft, but the latter is merely split and bound with sinew or thong; but the open socket for the harpoon head is wrought with



Fig. 12.

FUEGIAN BARBED
HARPOON.Collected by Thomas and
Leslie Lee. Cat. No.
79091. U.S.N.M.

more care. The Fuegian harpoon is thrust with both hands or thrown. It has no hand rest on the shaft to make the blow more effective, nor did these natives have knowledge of the harpoon arrow or the throwing stick, a device prevalent in many other parts of America for propelling the harpoon. The shaft as now seen is a creditable part of the implement, being often 12 feet long and cut out with eight sides rather than round. The thong also is carefully knotted to the shaft a few feet from the barbed head, its length nicely adjusted to the setting of the harpoon for action.

Chilean type.—On the Atlantic slope from the Straits of Magellan to the mouth of the Rio Negro, the bow and arrow (formerly), the long-handled spear, but, more than all others, the different varieties of bolas, were the hunting implements. To find the harpoon it will be necessary to cross the Cordilleras and visit the archipelagos of the Pacific coast. Here amidst the greatest abundance, having little contact with Europeans, the tribes of Aucanian and those of unknown affinities plied a harpoon not much in advance of those of Fuegia (fig. 13 *C*). It is to all intents and purposes a good North American arrow, chipped head, foreshaft, lashing crossed over the barbs of the head, and conical base for making a joint with the shaft.

Fig. 13, A and B represent barbed harpoon heads in the U. S. National Museum from Arica, Peru. The heads are of chipped stone set by a tang into a socket in the end of its foreshaft or tang and bound with fine string. The column of the foreshaft is cylindrical, terminating below in a bulb, which serves both to hold the connecting line and to make a loose joint with the shaft.

In the Blake collections, Peabody Museum, is a similar barbed harpoon from Chacota, Peru, with point or blade of stone, tang of wood, and with conical butt end to fit in a socket.¹ Comparing these examples with the Fuegian type, the great advantage which one people may have over another caused by differences of material is apparent. The Fuegian, in order to join the head with the shaft of the harpoon, knows nothing better than to split the front of the handle and make the joining as secure as possible by lashing with rawhide, or sinew cord, which shrinks in drying. Soon, however, this becomes loose again, and makes it necessary to repeat the process of fastening. It is a poor joint at best. As soon as the fisherman, coming northward, discovers the tough and straight cane, a new device is possible, and a better joint. Indeed, nature bores the hole regular in form for the butt end of the harpoon head. By cutting the stem of the cane just above the joint an ideal socket is effected. When the harpoon head is set securely into this socket and the outside wrapped with stout thread, the best of joints is effected. The butt end of all South Ameri-

¹ Eleventh Annual Report of the Peabody Museum, p. 290, fig. 15.

can harpoons, within the area of the cane, belong to the type here shown regardless of tribe or location.

In Stübel, Reiss, and Koppel Kultur und Industrie Sudamerikani-

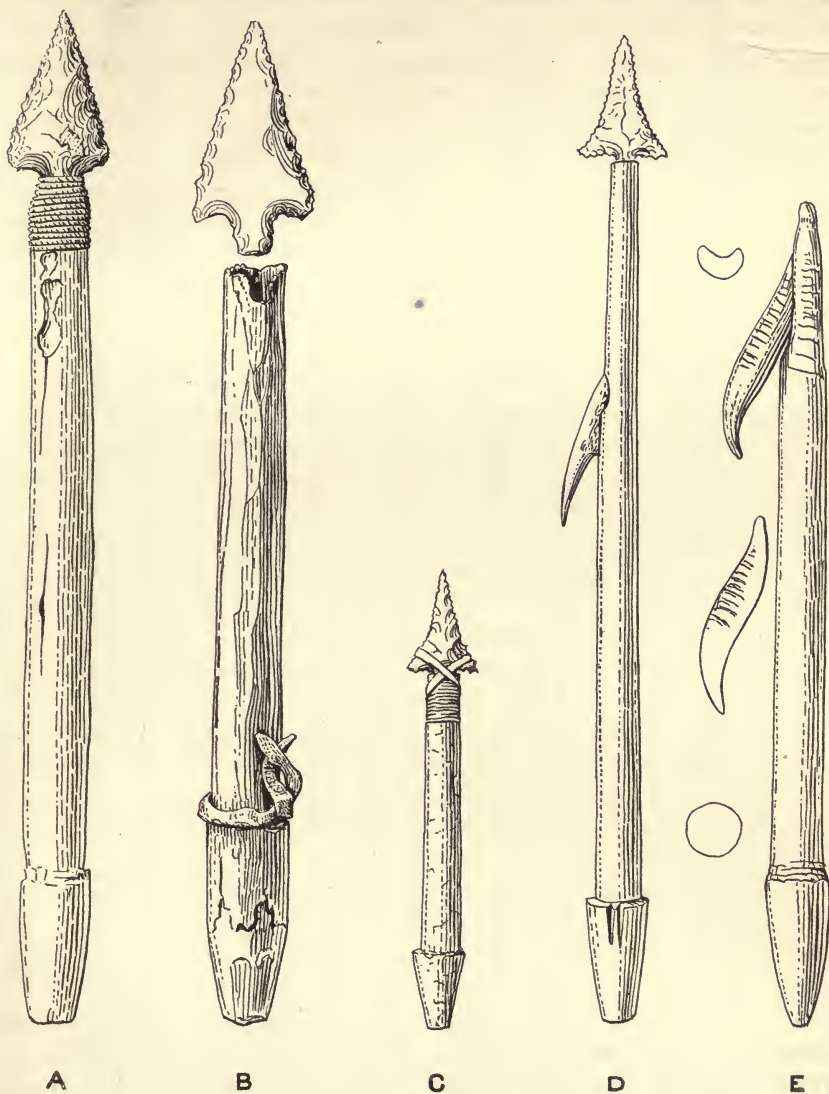


Fig. 13.

BARBED HARPOON HEADS.

Chile and Peru.

A-C, Cat. Nos. 136850a and b, U.S.N.M.; D, Peabody Museum; E, Charles Read.

schcr Völker, is figured a harpoon from Arica, Peru. It consists of a head of syenite and a tang of wood. The stone head is barbed and the tang of wood is fastened with a seizing of woolen cord. At the

lower end of the wooden tang there is a projection for a cord which fastened the head to the upper end of a shaft or reed cane. The lower end of the tang is conical, to fit into the end of the cane. There is a rudeness about the Peruvian and Chilean harpoon heads worthy of attention. The better classes of this ancient people were skillful in many arts. There is in these appliances of capture, therefore, evidence of a humble fishing caste, or of a tribe not identical with Aymaras and Kechuas. The spirit of invention was not entirely wanting in this area, however, as *D* and *E*, fig. 13, show. The last named is taken from Charles Read's paper in the Journal of the Anthropological Institute (volume xix, page 60). Side barbs are set on the side of the wooden tang of the head, partly let in, partly cemented, and in one example served. All the elements here rudely put together will again appear on this same Pacific coast at its northern extremity in their latest elaboration.

In the Hassler collection of the Field Columbian Museum are barbed harpoons from southern Brazil. The bone of an animal forms the point and a barbed piece of hard wood the tang of the head, which is attached by a short piece of rope to the end of the long shaft. In some examples the bone is socketed and set on the end of the tang; in others a spindle-shaped bone is lashed diagonally to the beveled end of the tang. Attention is here specially invited to the bone which forms the body and blade of this head, because it is an ideal, if not the real, beginning of all toggle heads of harpoons. A short piece of bone, conical in form, is cut out so as to be sharp in front and cup-shaped in the rear. If this is set on the end of a hard wood foreshaft and driven into the body of a fish or other animal it remains there and rankles. The arrow shaft is withdrawn, but if the bone be tied to the shaft it becomes a retriever. It toggles in the body of the game. The attachment of spurs at the base of this head brings about the made-up toggle head of the north Pacific coast.

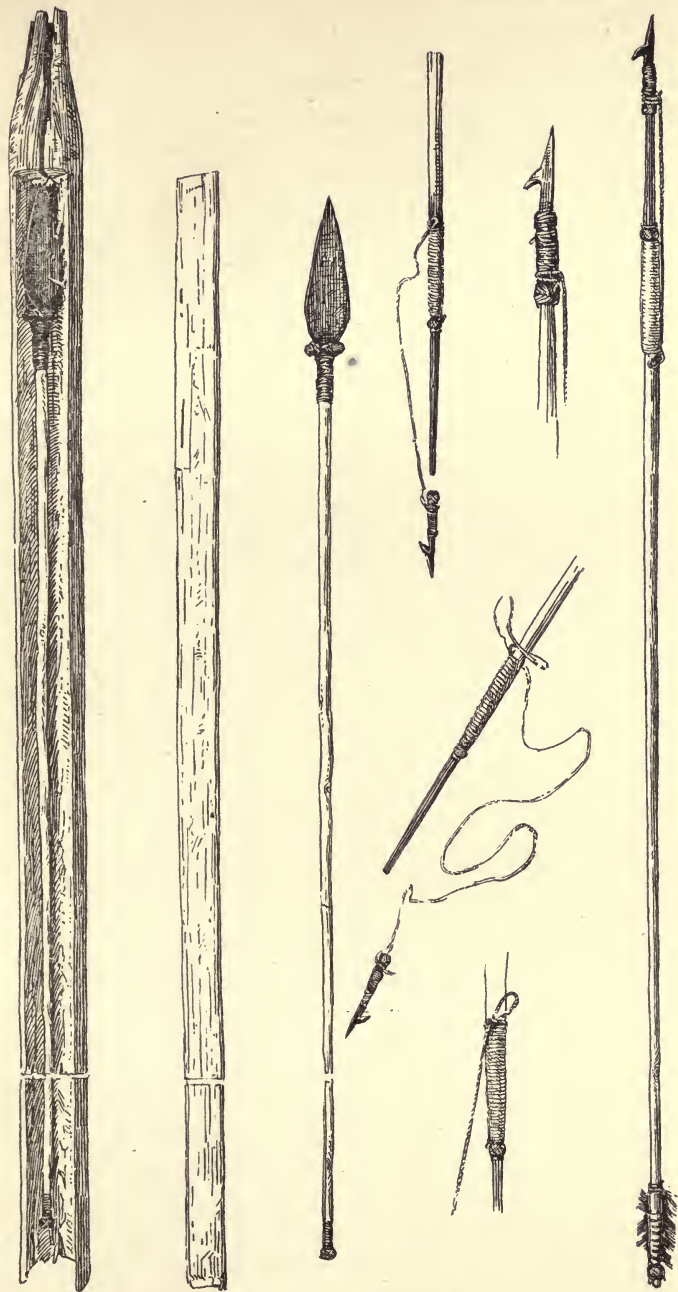
The turtle harpoon arrow in the Solimoens, Brazil, has a lancet-shaped point of steel fitted into a peg, which enters the tip of the shaft. This head is secured to the shaft by a twine of pineapple fiber, 30 to 40 yards long and neatly wound around the shaft. When the blade enters the shell the head of the arrow pulls out and the animal dives to the bottom, leaving the shaft floating. The Indian, on perceiving a movement in the water, shoots his arrow into the air and it never fails to pierce the shell of the submerged animal.¹

The Amazon Indians hunt the manatee for food in small canoes and kill it with harpoons, the blades of which are made of shells.²

The Upper Shingu tribes hunted and fished with bow and arrow, though fishing was sparingly done in this way. The harpoon arrows

¹ Bates, On the Amazons, 1875, p. 293.

² Acuña, New Discovery, Hakluyt, No. 24, 1859, p. 69; Bates, loc. cit., 1875, p. 245.



HARPOON ARROW AND SHEATH, VENEZUELA.
Museum of the University of Pennsylvania.

of the Bororo Indians of the headwaters of the Paraguay River; in southwestern Brazil, are used for capturing alligators and large fish. The shaft is of the Uba reed, and at the butt end has two whole feathers laid on flat. The head consists of a shaft of hard wood about 2 feet long, to which are fastened the point and barb, made of a piece of bone or very hard wood, sharpened at both ends, and laid on the top of the foreshaft diagonally so as to form the piercing portion in front and the hook in the rear. The barb is lashed on to the foreshaft by means of a twined string, the other end of which is attached to the shaft, so that when the head is drawn out the shaft itself serves as a buoy. For about 2 feet the outer end of the reed shaft is wrapped with the same cord that connects the reed with the shaft. The inner end of the foreshaft fits into the hole of the reed (fig. 14). Length of this spear, 6 feet. It is pictured in Von den Steinen, 1894, page 484. Among the Bororo (Tupian family) is to be found a modification of this type of harpoon in which the shaft is not fastened to the line but held in the hand of the fisherman, who dives after his game.

A harpoon arrow of the Venezuelan Indians is shown in Plate 3. The specimen is in the museum of the University of Pennsylvania. The shaft is of reed, without a joint. At the shaftment there are two half feathers set on radially and held in place by wrappings of black and white thread in alternate bands. In a few places the thread passes over the shaft of the quill, and elsewhere the bands of thread do not touch the feather and have nothing to do with the lashing. At the nock, a ball-like projection is formed by the wrapping of thread. A piece of hard wood is inserted in the notch to fit through the bowstring. At the front end of the shaft a similar object is wrapped around the end to strengthen the socket of the foreshaft, which is a reed of black palm about 8 inches in length, sharpened at its lower end, and driven into the reed. It tapers gradually toward the fore end, where it fits into the head. The head consists of a barbed point of iron and a socket piece or a shank of wood, into which the iron is fitted. At the base of this shank is a short wrapping of twine, mixed with gum, resembling a turk's-head knot. This acts as a stop to the line. The same wrapping extends from the line outward nearly to the barb on the point. The harpoon line, which is 10 feet in length, is

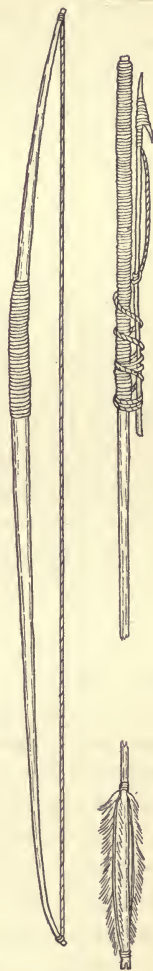


Fig. 14.

HARPOON ARROW.
Bororo Indians, Brazil.
After Von den Steinen.

tied around the head at one end and at the top of the shaft at the other end. When this weapon is set ready for action, the barbed head is placed on the end of the foreshaft. The line having been wrapped neatly around the top of the shaft, almost to its end, a loop or slip-knot is formed at the last turn, and drawn tight. When the game is struck, the head is withdrawn, the slip-knot untied, the line unwound, and the heavy portion of the shaft drops into the water, the feather projects into the air, and the apparatus acts both as a drag and as a signal. Excepting the iron point, which might easily be replaced by one of bone, the whole apparatus is aboriginal, and the wide prevalence of this particular combination of parts leads to the belief that we have here an early and unchanged American harpoon arrow. It is interesting also from the point of view before mentioned, that it is a step in the progress of the toggle head. If a Columbia River Indian were to fasten a spur on the end of the cup-shaped socket, the combined barbed and toggle heads, to be more fully illustrated and described, would be realized. This form of harpoon head, in which the socket is on the movable part instead of being in the end of the shaft, is quite well diffused in the Amazon drainage and on the Pacific coast. It is not found in the shell heaps or mounds of eastern United States, but is common in western Canada and universal among the Eskimo.

The harpoon arrows of the tribes in British Guiana are used for shooting fish, pacu (*Pacu myletes*), which abound at all seasons of the year, according to Im Thurn, in most of the large rivers of Guiana. When the river is high and the water is turbid with rain the pacu are distributed equally in all parts of the stream and are almost invisible. When, however, in the dry season, the river is low and the water clear, when the rocks which form the rapids are partially uncovered, and the "pacu grass," a small water plant (*Lacis*), which clothes these rocks, comes into flower, then the pacu collect at the falls to feed on the leaves. Large numbers of Indians then camp at the sides of the falls to shoot these fish. Such a scene is highly picturesque. The place is generally a wide extent of river bed, apparently inclosed by the forested banks, and entirely occupied by a curious confusion of rocks and white, rushing water. On a rock in the midst of, and almost covered by the tumbling water, stands an Indian, his feet crushing the delicate, star shaped, pink flowers of the lacis, and every muscle in his naked, cinnamon-colored body bearing witness to the intensity of his watch. His bow is half drawn, the arrow is in position, but its point rests idly on the rocks. The water is rushing and tumbling so wildly that an unpracticed eye can see nothing below its surface. But the Indian sees. Quickly the bow is raised, the aim is taken, the arrow flies, and its shaft is there, dancing and tumbling in the water, carried here and there by the terrified rushes of an unseen pacu. in the body of which the arrowhead is embedded. But

the line not only connects arrowhead and arrow shaft, but its other end is held firmly in the hands of the Indian, who now easily hauls the fish on to the rock. Sometimes, instead of waiting on a rock, in his eagerness he stands in the midst of the almost overwhelming rush of the water, stooping, the better to resist its force. In either case, if he is skillful, he gets a large number of fish. Im Thurn saw 15 pacu, averaging about 7 or 8 pounds in weight, shot by one man in twenty minutes. When enough have been taken the Indian loads his canoe and returns to his temporary camp. The fish are then cut open and cleaned, their sides are slit again and again, salt is rubbed in, and they are put on the rocks to dry in the sun.

It is not, however, only in the falls that the Indian shoots fish, though he rarely gets pacu elsewhere. In the smooth reaches of the river he shoots others of various kinds. Indeed, he can almost always and everywhere find fish to shoot, and he seldom fails to hit them when they are once seen. When the water is smooth two other fish arrows are used. Of these one¹ differs from the harpoon before mentioned in that a short line connects only the head—which in this case also is slipped on to the shaft—and the shaft, instead of being carried on the arm of the shooter. The struggles of the fish when hit immediately cause the shaft to slip out of the head, and the former, which is very long and light, floats on the top of the water, but remains connected with the fish by the line, and so serves as a buoy and marks the position of the fish.²

NORTH AMERICAN HARPOONS.

Between the northern and the southern continents of the Western Hemisphere the mode of communication was by land or by water. By land the dividing line between North and South America was very near the route of the projected Nicaraguan Canal. The gold-working Chibchas of British Columbia had as their northern boundary the San Juan River. By water there was no partition between the continents. The Caribian and the Arawakan tribes encountered by Spanish explorers all about the Caribbean Sea were also found away southward in the Orinoco drainage and farther. There will be no surprise, therefore, on finding the same devices of capture widely distributed. The same animal will be killed in many places with similar harpoons, because in the struggle for survival among weapons this or that form proved the fittest; also because of that subtle, imaginary kinship between men and animals of prey which encourages the man to follow animals of particular species. The barbed head, with tang fitting into a socket at the end of the shaft, and the socketed head, whose cup-shaped base fits on to a pointed foreshaft, continue to exist with little change until

¹ Im Thurn, *Among the Indians of British Guiana*, 1883, p. 235, fig. 9b.

² *Idem.*, pp. 235–237.

California is reached. The barbed harpoon head with cup-shaped base there takes on spurs and becomes a toggle head without barbs.

Of harpoons on the Mosquito coast of Nicaragua and Honduras Squier says:

The women were left on the beach and three men apportioned to each boat—a paddler, a torch bearer, and a striker. Torches made of pine splinters; spears of two kinds—one (*sinnock*) fixed by a shank at the end of a long, light pole and kept in the hand; the other (*waisko-dusa*) shorter, staff hollow, iron-barbed head, fastened to a line passing through rings by the side of the shaft, wound to a light wood float. When thrown the head remains in the fish, the line unwinds, the float rises to the surface to be seized by the fisherman, who hauls in his fish at leisure.¹

The same author says that the Mosquito Indians capture thousands of turtles with harpoons.

The Ulva Indians, of Bluefields Lagoon, pursue the manatee. One man sits in the stern of a flat-bottomed dugout (pitpan) to steer, one crouches in the bow with a harpoon, the rest kneel on the bottom, lances in hand. The boat is covered with boughs to resemble floating trees. The man at the bow launches his harpoon, the animal makes a plunge, the boughs are thrown overboard, and the lance men make ready. The bowsman gradually hauls in his line and the animal, after some maneuvering, comes to the surface, where it is stabbed with a lance. After a series of struggles it is secured.² These processes of paddling, harpooning, throwing the boughs overboard, hauling in the line, and stabbing with the lance may be carefully noted, in prospect of coming descriptions relating to harpoon work by the Eskimo.

Clavigero describes the Mexican tlacochtli or dart, a small lance of otalli or some other strong wood, the point of which was hardened by fire or shod with copper, or itzli, or bone, and many of them had three points. The Mexicans fixed a string to their darts in order to pull them back again. This weapon was especially dreaded by the Spaniards.³ The line affixed to the darts is a harpoon characteristic. The three-pronged barbed harpoon head is also to be seen on Lake Patzcuaro at present.

A turtle harpoon⁴ of the Seri Indians of Tiburon Island, in the Gulf of California and the mainland adjoining, is shown in fig. 15. It comprises a point 3 or 4 inches long, made from a nail or bit of stout wire, rudely sharpened by hammering the tip (cold) between cobbles, and dislodging the loosened scales and splinters by thrusts and twirlings in the ground; this is set firmly and cemented with mesquite gum into a foreshaft of hard wood, usually 4 or 5 inches long, notched to receive a cord and rounded at the inner end. This rounded end fits into a socket of the main shaft, which may be either a cane stalk or a section

¹ E. G. Squier, *Mosquito Shore*, London, 1856, p. 74.

² *Idem.*, p. 104.

³ *History of Mexico*, II, Philadelphia, 1817, p. 166.

⁴ W J McGee, *Seventeenth Report of the Bureau of Ethnology* (1898), p. 187.

of mesquite root, while a stout cord is firmly knotted about the tang of the head and either attached to the outer end of the main shaft or carried in the hand of the user. The shaft is usually 10 or 12 feet long, with the socket in the larger end, and is manipulated by a fisherman sitting or standing on his balsa. On catching sight of a turtle lying in the water, he approaches stealthily, preferably from the rear, yet in such wise as not to cast a frightening shadow, sets the foreshaft in place, guides the point close to the victim, and then by a quick thrust drives the metal through the shell. The resistance between the turtle shell and the metal holds the point in place, and although the head is jerked out at the first movement of the animal, the cord prevents escape; and after partial tiring, the turtle is either drowned or driven ashore, or else lifted on the craft. Dr. McGee quotes the following minute account of Seri turtle capture:¹

An Indian paddles himself from the shore on one of these by means of a long elastic pole of about 12 or 14 feet in length, the wood of which is the root of a thorn called mesquite, growing near the coast; and although the branches of this tree are extremely brittle, the underground roots are as pliable as whalebone and nearly as dark in color. At one end of this pole there is a hole an inch deep, into which is inserted another bit of wood in shape like an acorn, having a square bit of iron 4 inches long fastened to it, the other end of the tree being pointed. Both the ball and cup are first moistened and then tightly inserted one within the other. Fastened to the iron is a cord of very considerable length, which is brought up along the pole, and both are held in the left hand of the Indian. So securely is the nail thus fixed in the pole that although the latter is used as a paddle it does not fall out.

A turtle is a very lethargic animal, and may frequently be surprised in its watery slumbers. The balsa is placed nearly perpendicularly over one of these unsuspecting sleepers, when the fisherman, softly sliding the pole through the water in the direction of the animal till within a foot or two of it, suddenly plunges the iron into its back. No sooner does the creature feel itself transfixed than it swims hastily forward and endeavors to liberate itself. The slightest motion of the turtle displaces the iron point from the long pole, which would otherwise be inevitably broken and the turtle would as certainly be lost; but in the manner here described it is held by the cord fastened on to the iron which has penetrated its back, till, after it has sufficiently exhausted its strength, it is hoisted on board the canoe by the fisherman, who proceeds to the shore in order to dispose of his prize.

A barbed head, with wooden shaft, together forming a turtle spear-head, is shown in fig. 16, by McGee (1898, p. 193).

The only approach to the harpoon type in all the Pueblo region is an insignificant apparatus for capturing vermin. But the cliff dwellers had the throwing stick, and a spear with a head of stone set on a tang of wood conical at its inner end, like so many found in Peru and Chile. The Yokut Indians (Mariposan family) on Tulare Lake, California, are said by Powers to erect brushwood shelters over the water, in which the Indian lies flat on his belly peering down through a hole.² When a fish passes under, he strikes it with his two-pronged

¹ Hardy's Travels, 1829, p. 296.

² Stephen Powers, Tribes of California, 1877, p. 376.

harpoon (1877, p. 376). No other region in America illustrates more aptly what has been previously said about the dependence of culture-progress on the bounty of nature. The Tulare women are among the most skillful basket makers in the world, and their ware is sought far and wide. The material is at hand. But the Tulare men have reduced the harpoon to its lowest terms, for two reasons—the animals

requiring a better perfected implement are not at hand, and the materials for constructing the weapon are not forthcoming.

The Indians of the Sacramento Valley, in California, not being subjected to the prohibition of the game laws, are allowed to capture game at any season of the year, and when the salmon are in the river to spawn they take them by means of toggle harpoons, one of which is nearly 25 feet in length.

The Sacramento near its head is very swift, and in its passage across different ledges of various degrees of softness excavates large pools or holes in its bed, each having a small fall, and there is a rapid beyond. The water in these holes, which are often very large, is comparatively still, and they make welcome resting places for the tired salmon before they attempt the passage of the rapid above. The water is beautifully cold and clear, and the fish can be seen crowding together on the bottom. The Indians repair to one of these holes to the number of twenty or more. Some station themselves at the rapids above and below; others wade out to an isolated rock, or a log projecting into the stream. All hold their harpoons in readiness, and at a signal from the leader strike. At the first onslaught each manages to secure a fish, which is detached from the harpoon head

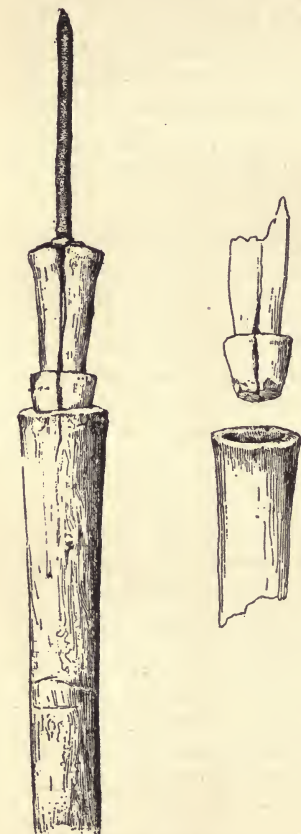


Fig. 15.

TURTLE HARPOON.

Seri Indians.

Collections of the Bureau of Ethnology.
After W J McGee.

and thrown on the bank. The harpoons, having toggles of steel which become detached from the stock when they enter the fish, and being attached to the shaft by cords, turn flat against the fish's side and make escape impossible when the salmon is pierced through. Sometimes three or four hundred are thus harpooned from one pool.¹ The Wintun

¹ Hallock, *Forest and Stream*, VI, June 1, 1876.

Indian ties two poles together near one end, sets them in deep water near the shore, the bottoms a few feet apart; on this he sets a log, one end resting on the shore. From this fishing station he harpoons the black-backed salmon. The shaft is often 15 feet long; the head, a joint of deer's bone, is 3 inches long, with socket to fit on the end of the foreshaft and line tied about its middle. This head is driven quite through the fish and toggles on the other side. The reader can not fail to recall the toggle heads of bone in the heart of Brazil. The Yurok also spear salmon from booths with toggle harpoons.¹ The Wintuns belong to Powell's Copehan family. They are skillful arrow makers and their women dainty weavers of twined basketry. But the abundance of the game as well as its accessibility have acted here, as in all other places, to deter the inventive faculty. The thrusting of a toggle quite through a fish was indeed an effective mode of capture, but it did little to elevate the mind of the captor.



Fig. 16.

BARBED HARPOON
HEAD.

Seri Indians.
Collections of the
Bureau of Ethnol-
ogy.
After W J McGee.

known on the Pacific coast of the United States north of San Francisco, as well as British Columbia and Alaska, made no advances as an invention. The Nacum Indians are too far inland to have had the stimulus for improving an apparatus which demands sea room for development.

The Hupa and Humboldt Bay Indians construct the toggle heads of their salmon harpoons as follows: A point of antler, bone, or metal from $2\frac{1}{2}$ to $3\frac{1}{2}$ inches in length, more or less flattened and sharp at the tips, is armed at its lower extremity with

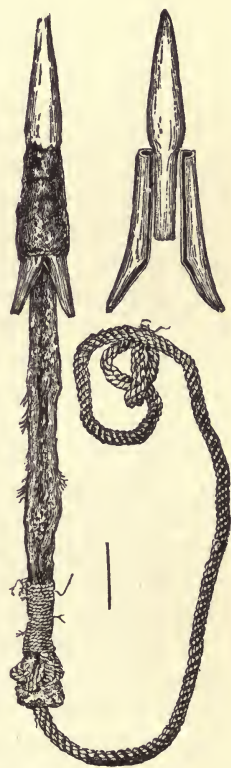


Fig. 17.

TOGGLE HARPOON.

Hupa Indians, California.
Collected by P. H. Ray. Cat. No.
126525, U.S.N.M.

¹ Stephen Powers, Tribes of California, 1877. See his index, under fishing.

two barbs laid alongside, lashed down, and covered with pitch. (Fig. 17.) In the same lashing is included one end of the leader, a short strap of deer rawhide. Into a slit at the other end is spliced the line, a piece of rope from 1 to 3 feet long, attached at its opposite end to the side of the shaft. Some spears have two or more prongs, each armed with one of these toggle heads. When the fish is struck its struggles detach the toggle head and it is retrieved by means of the line and pole. Toggle heads of similar type are in use among all the salmon-eating Indians of northwest California.¹

In the figure shown will be seen the transition of the rankling arrow head of South America into a toggle head. There must be point, barbs, or spurs, line attached between ends, and socket in every harpoon. In this noteworthy type the point and the flukes or barbs are separate, and the socket is ingeniously effected by the combination of point, spurs, and rawhide leader.

The spring salmon, says Gibbs, are taken on the rivers Sacramento, Klamath, Columbia, and Kwinaiutl with a harpoon, the points or barbs attached loosely by a thong, so as to give play to the fish. On some of the rivers, where the depth permits, weirs are built to stop their ascent.²

The relationship of weirs, dams, and stops of various kinds with the harpoon may be mentioned in this connection, since the California and Oregon tribes, barred out from ocean fishing by absence of archipelagoes, were compelled to invent equivalents. The old-time harpoon was even then adequate, but engineering schemes were stimulated and so the intellect was quickened. The cooperative results in dam building, strengthening as they did the social tie, are not to be despised. Indeed, Powers, who knew those tribes half a century ago, has much to say about their manliness and resource, both in fishing and hunting. The same will be found true not only on the Atlantic side of the United States but on both sides of South America.

It must not be overlooked that the Pacific Ocean all along the Mexican and Californian coast was no friend to the canoe. Fishing was done inland. The coastal plain, indeed, was the pasture land of vast marine herds that needed no shepherds, but at the proper season they rounded themselves up and proceeded into the various open streams to their spawning grounds, where they were slaughtered without mercy and in such way as to awaken little thought in the minds of their captors.

Cat. No. 131358 in the U. S. National Museum is a barbed head of a harpoon from the Nal-tunne-tunne Indians, Oregon, collected by Rev. J. Owen Dorsey, consisting of an iron arrow head with long sharp barbs on each side and a wooden shank barb piece having two unilateral

¹ Smithsonian Report, 1886, Pt. I, p. 224, pl. xix, fig. 80.

² George Gibbs, Contributions to North American Ethnology, 1877, I, p. 195.

flukes (fig. 18). On this wooden shank, the butt end of which fits loosely into the socket of the shaft, is a projection to hold the string connecting head and shaft. This tribe of Indians belong, as their name shows, to the Déné or Tinné Indians, whose home is in central Alaska and the western portion of the Dominion of Canada. This Athapascan family is represented on the Pacific coast also by the Hupa, Wailaki, Saiaz, and many other tribes given by Powell (1891, p. 55). The time of their migration is not known, but extensive movements have taken place since the coming of the whites. They have added nothing to the inventions of the locality. The barbed harpoon blade, with barbs also on its shank, is widespread.

Sixty years ago Wilkes described harpooning at Walla Walla, on the Columbia River, as very much like that at Willamette Falls, except there is no necessity for planks to stand on. The Indians use hooks and spears attached to long poles, both of which are made to unship readily and are attached to the pole by a line 4 feet below its upper end. If the hook were made permanently fast to the end of the pole, it would be liable to break and the large fish more difficult to take. The Indians are seen standing along the walls of the canals in great numbers fishing. It is not uncommon for them to take twenty or twenty-five salmon in an hour.¹ Wilkes brought home one of their harpoon heads, which is combined barbed and toggle, made up as follows: The head is of iron, triangular in shape, with a large barb on one side. The shank is set in between two pieces of bone, which serve three purposes, namely, to hold the shank firmly, to become two spurs at their outer ends, and to form a socket for the end of the shaft by the hollow between them. The line or leader is laid on the joint between them and the whole lashed securely together and dipped into hot pitch. The line is of many strand braid.

One of the oldest pieces in the U. S. National Museum, Cat. No. 1439, collected by Lieutenant Whipple, is of similar type, only there is not a bit of iron about it. So far as its materials and form are concerned, it might have come down from aboriginal times. The blade is of bone, having two large flukes or barbs on one side cut out. In this example also the spurs at the butt end, which form the toggle, are of bone. The leader joining the head to the shaft is a strap of rawhide. The blade, spurs, and line or leader are neatly joined together with thread and pitch, so as to provide a socket for the end of the shaft.



Fig. 18.

BARBED HARPOON
HEAD.

Naltunne Indians,
Oregon.

Collected by J. Owen
Dorsey. Cat. No.
131,358, U.S.N.M.

¹ Charles Wilkes, Exploring Expedition, IV, p. 384.

Those who understand the difficulties which beset the savage artisan in making a good joint will appreciate this efficient combination.

The Twana Indians, of Washington State, make one kind of salmon hook of a straight piece of steel about 6 inches long, and sharp. On each side of it pieces of bone are tied. A line is attached and also a pole 15 or 20 feet long, in such a way that by means of the pole it may be driven into the fish, the pole drawn out, and the hook remain, held by the string, when it is drawn in.¹

They (the Twana) sometimes use harpoons for seal fishing. The point is of iron, and the spear and line used as with the salmon hook just described.²

The shaft of the Quinaielt salmon harpoon is made of cedar, the fork of the wood of the salmon berry; the toggle heads of wood or metal.



Fig. 19.

SALMON SPEAR.

Quinaielt Indians, Washington.

Collected by C. Willoughby.

The loop of cord, which is 16 feet long, is for the left hand. The length of the spear is nearly 16 feet. This spear is used on the bar of the river at low water.³ This most interesting specimen recalls the heart of Brazil. There a short piece of monkey's bone was pointed in front, while nature formed the socket at the base to fit over the foreshaft. In the Quinaielt specimen the monkey bone is replaced by a combination of bone and metal, the cup-shaped cavity at the base fits also over the foreshaft, but a short line or leader passes from the middle of the head to the fore end of the shaft. This is a full-fledged toggle harpoon of a primitive type (fig. 19).

The Indians of Neah Harbor, says Wilkes, capture the whale with a buoy made of a seal's skin, which is blown up after the manner of bladder, forming a large oblong float. These floats are 4 feet long by 18 inches or 2 feet in diameter, and are made fast by a rope to the harpoon or spear which is thrown at the whale, and becoming fastened to it pre-

¹ M. Eells, *Hayden's Bulletin*, 1877, pp. 3, 63, 78, 79, 81.

² *Idem.*, p. 80.

³ *Smithsonian Report*, 1886, Pt. 1, p. 271, fig. 4.

vent its diving down to any great depth. After having a number of these joined to it the animal is unable to quit the surface and is finally captured.

All those whose sealskin floats are attached to the animal now divide the booty. Those who are entitled to a share are easily known, for each float has a different pattern printed upon it.¹

From Vancouver Island around the interminable coasts of North America to eastern Greenland the float is only in a few places absent from the harpoon in some form. It may be, as in this example, the hide of an immense seal, perhaps of a smaller seal, elsewhere a bladder or intestine inflated. On the coast of British Columbia, in the absence of sealskins, the unconquerable genius of invention substitutes a large bag or wallet of cedar bark, and the Labrador Eskimo attaches a bit of plank to the butt end of his harpoon shaft. The motive is the same. A huge animal, to be captured, must not only be stabbed, but held back by an unwearying device which takes the place of the hunter's hand and arm.

The Makah, living on the northwestern point of Washington State, pursue the whale in their dugout canoes. On one occasion, says George Gibbs, a canoe was gone five days. Their tackle consists of a harpoon, the point formerly edged with shell, now usually with copper, very firmly secured to a line and attached lightly to a shaft about 15 feet long, to which also the line is made fast; a sealskin float is attached to another line and serves to buoy the whale when struck. The scene of the capture is described by eyewitnesses as very exciting, ten canoes being sometimes engaged, the crews yelling and dashing their paddles with frantic eagerness. When taken, the whale, buoyed up with floats, is towed in triumph to the village and cut up.²

The Makahs belong to the Wakashan family, whose chief abode is on the outer side of Vancouver Island. They are the Nutkas of Captain Cook and of the early explorers. But in this connection they are at the gateway of the North Pacific archipelago, where, after a lonesome search stretching from Magellan Straits, the student encounters the Caribs of the west. One after another Wakashan, Salishan, Haidah, or Skiddegatan and Tlinket, or Koloschan come out to meet him in their graceful dugouts of cedar.

The Makah whaling harpoon consists of a barbed head, to which is attached a rope or lanyard, always of the same length, about 5 fathoms, or 30 feet. This lanyard is made of whale's sinews twisted into a rope about an inch and a half in circumference and covered with twine wound around it very tightly, called by sailors "serving."

The harpoon head is a flat piece of iron or copper, usually a saw blade or a piece of sheet copper, to which a couple of barbs made of

¹ Charles Wilkes, *Exploring Expedition*, IV, p. 486.

² George Gibbs, *Contributions to North American Ethnology*, 1877, I, p. 175.

elk's or deer's horn are secured, and the whole covered with a coating of spruce gum. Formerly the blades were of mussel shell. The shaft is made of yew, in two pieces, which are joined in the middle by a very neat scarf, firmly secured by a narrow strip of bark wound round it very tightly. The length is 18 feet; thickest in the center, where it is joined together, and tapering thence to both ends. To be used, the staff is inserted into the barbed head, and the end of the lanyard made fast to a buoy, which is simply a seal skin taken from the animal whole, the hair being left inward. The apertures of the head, feet, and tail are tied up air-tight, and the skin is inflated like a bladder. One example collected by Swan is 3 feet long (fig. 20).

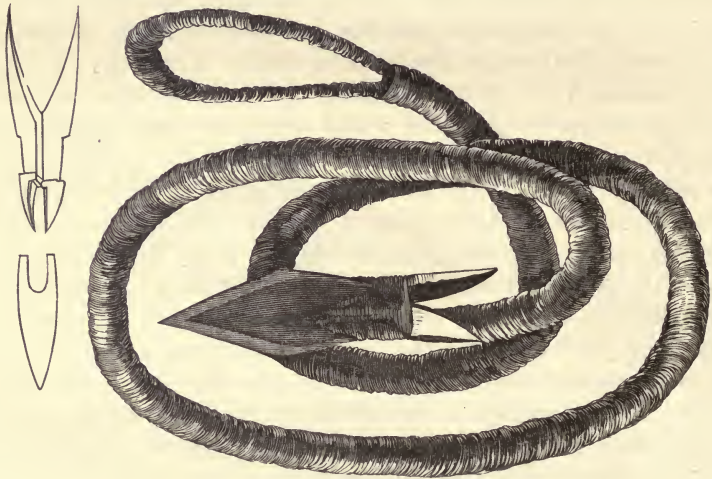


Fig. 20.

TOGGLE HEAD AND LINE.

Makah Indians, Washington.

Collected by James G. Swan.

When the harpoon is driven into a whale the barb and buoy remain fastened to it, but the staff comes out, and is taken into the canoe. The harpoon which is thrown into the head of the whale has but one buoy attached; but those thrown into the body have as many as can be conveniently tied on; and, when a number of canoes join in the attack, it is not unusual for from thirty to forty of these buoys to be made fast to the whale, which, of course, can not sink and is easily dispatched by their spears and lances. The buoys are fastened together by means of a stout line made of spruce roots, first slightly roasted in hot ashes, then split with knives into fine fibers, and finally twisted into ropes, which are very strong and durable. These ropes are also used for towing the dead whale to the shore.¹

¹James G. Swan, Smithsonian Contributions, XVI, pp. 19-21.

The Makahs, according to Swan, are not active in vocations or pursuits other than fishing and whaling, and obtain some of their supplies by barter from neighboring tribes and white men. They devote very little time to agricultural pursuits or to the capture of land animals, but excel in the management of canoes, making long voyages from land for fish, and fearlessly attacking the whale. They manufacture their own fishing apparatus, and take especial pains with their harpoons and lances, for which instruments they have the greatest regard. The principal implements used by the Makah whalers are harpoons, lances, ropes, and buoys. The harpoon heads were formerly made of shell, but at present are of sheet copper or steel, with barbs of elk or deer horn, tightly seized to the blades by cords or strips of bark, the whole being covered with spruce gum. The lanyards attached to the harpoon are made of the sinew of the whale twisted into a rope and served with fibers of nettle. The lances are of metal, with sockets for the ends of the poles. The poles for the harpoons and lances are

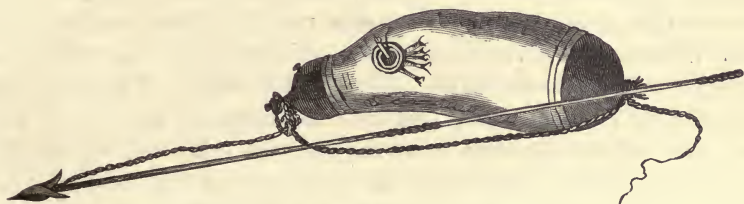


Fig. 21.

SEALSKIN FLOAT.

Makah Indians, Washington.

Collected by James G. Swan.

heavy and unwieldy, but durable and strong. The buoys are of sealskin with the hair inside, inflated when used, and attached to the harpoon lanyards. These buoys are used for the double purpose of impeding the progress of the whale, so as to enable the Indians to kill it, and to prevent the animal from sinking when dead.

All whaling implements which have been used in the capture are regarded with especial favor and handed down from generation to generation, and it is deemed unlucky to part with them. These Indians did not acquire the art of whaling from white men, and still employ the apparatus and processes which have come to them through countless generations. One point deserves especial consideration. The process of wrapping their harpoon lanyards, commonly known as "serving," has been in use by all seafaring men for a number of years. The Makah Indian has his serving stick and mallet, manufactures his twine from the fibers of the nettle, and "serves" his lines as neatly as do the fishermen of the Eastern coast, and it is said they were familiar with the process before the advent of the whites.¹

¹ James G. Swan, Indians of Cape Flattery.

The implements used by the Makah Indians for catching salmon were a hook and a spear. The former is in size as large as a shark hook, having a socket at one end formed of wood. These hooks are made by the Indians from files and rasps, which they purchase of the traders, and are forged into shape with ingenuity and skill. The socket is made from the wild raspberry bush (*Rubus spectabilis*), which, having a pith in its center, is easily worked and is very strong. This socket is formed of two parts, firmly secured to the hook by means of twine, and the whole covered with a coat of pitch. Attached to this hook is a strong cord about 3 feet long. A staff or pole from 18 to 20 feet long, made from fir, is used, one end of which is fitted to the socket in the hook, into which it is thrust, and the cord firmly tied to the pole. When the hook is fastened into a salmon it slips off the pole and the fish is held by the cord, which enables it to perform its antics without breaking the staff, which it would be sure to do if the hook were firmly fastened.¹

Giglioli figures a barbed harpoon head (Kaheita), made of whale's bone, brought from Nutka by Captain Cook, and now in the Natural History Museum of Florence. It has two barbs on one side and is attached to a line 10 mm. thick, served with twine.² This most interesting object, 10 inches long, reduces the harpoon head to its lowest terms. It reminds the student of the Fuegian type, or, better, of the universal American fundamental barbed type. At the base or joint—and this is one of the crucial points for invention—there is merely the rudest kind of pivot to fit into the socket at the end of the shaft. There is no perforation, or even bulb, to hold the line. The shank is simply hacked to make it rough. Some old pieces in the U. S. National Museum, of bone, antler, iron, and copper, collected by Gibbs, McLean, and Fisher, have from one to four barbs on one side, and have line holes or projections for the end of the connecting line.

Ellis says that the Nutka (Wakashan) Indians had two kinds of harpoons—one of bone, the other of shell. The former—that is, the barbed head—is 6 inches long, pointed, having barbs on one side. Of the one with the shell blade, the butt end is “so contrived by means of a socket as to fix upon a pole 10 feet in length. The shaft is forked at the end, so that two pieces of the bone are to be fixed on at the same time.” To the shank of the barb a strong line is attached, to the other end of which is fastened a seal skin, blown up. The float is said to prevent the animal from keeping under water. It was dispatched with the lance.³ This corresponds precisely with the specimens in the National Museum collected by Swan in recent times. In one of his examples the mussel shell, ground to a razor edge, forms the

¹ James G. Swan, Northwest Coast, New York, 1857, pp. 40 and 41.

² Appunti intorno ad una collezione, etc., Florence, 1895, p. 131, pl. III.

³ Ellis, An Authentic Narrative, I, p. 221.

blade, and it is so neatly fitted between the spurs forming the toggle and covered with pitch as to make a sure and efficient weapon. All that the iron did later on was to replace the rather brittle edge of shell, without modifying any other portions of the intricate apparatus.

Marchand's account of the harpoon in Barclay Sound, west side of Vancouver Island, is here given. The strong lance, which may be called their unerring lance, is intended for striking the whale when he presents himself on the surface of the water, and never does an American fail to wound him at the first stroke. Instantly the sligher lances are employed for darting the harpoons, to each of which is fastened one of the long pieces of rope. The other end of the line is fixed to one of those large bladders filled with air. This sort of balloons, floating on the water, cease not to indicate the place where to find the whale, dead or wounded, that has carried with him a harpoon, and the fishermen, directed by this signal, follow him up and celebrate by songs of joy their victory and conquest. But the most difficult is not, undoubtedly, to deprive the monster of life. It remains for them to get possession of him, and it would never be believed, if we were not assured of the fact, that with skiffs so slight and ticklish as canoes hollowed out of the trunk of a tree a few men should succeed in dragging the space of 4 or 5 leagues an enormous mass and contrive to run it on shore on a beach, where they can cut it up.¹ A glimpse at the ethnographic chart of North America shows that the Aht or Nutka division of the Wakashan family occupies the western portion of Vancouver Island, while the coast of British Columbia belongs to the Haeltzukan branch, as shown by Boas. The same author fixes the limits of the Chimmesyan family on the coast between the Koloschan and the Haeltzukan tribes.² All about Puget Sound were Salishan tribes, and a small contingent of the same family approach the harpoon area at the mouth of the Bella Coola River.

Harlan I. Smith dug up at the junction of Thompson and Fraser rivers two barbed harpoon heads 9 inches long, made of antler. They have two barbs on one side and a hole for the connecting line.³

In a future paper the fishhooks of the same area will be discussed, from which it can be more clearly shown how the idea of the bent finger and its imitators in bone and wood has also dominated the form of the fish spear and the harpoon.

Niblack⁴ figures both barbed and toggle harpoon heads among the Haida Indians of Queen Charlotte Islands, British Columbia, a little

¹ Marchand's Voyage, London, 1801, I, pp. 492-493.

² Fifth Report of Committee on Northwest Tribes of Canada, British Association for the Advancement of Science, 1889.

³ Memoirs, American Museum Natural History, New York, II, p. 137, fig. 20.

⁴ Report U. S. National Museum, 1888, pl. xxix.

farther north. The barbed heads are of steel. The piercing end of each is lanceolate. The barbed portion is toothed or notched in its entire length, six barbs on the one side and five on the other, alternating. The tang is oval, perforated, and has a small loop or clevis riveted fast to it. Through this is secured a plaited lanyard or loop of seaweed, by means of which the head is attached to the foreshaft or to the main line. Each one of these fits in a cedar case, made by splitting a piece of wood, hollowing it out, and then lashing the parts together, a method adopted by these Indians in their musical instruments and various receptacles.

The toggle harpoon (Cat. No. 88929, U.S.N.M.) of the Haida Indians, figured by Niblack, is still more interesting, being quite similar to the harpoon arrowheads of the South American tribes. The head is of steel, the piercing ends in the form of a spike. At the other end the metal is split open and one portion extended backward for a barb or spur. Just where the spur unites with the body a rawhide line is wrapped to form a shallow socket. Into this the end of the loose shaft fits, being cut off in the form of a wedge at the end. The other end of the loose shaft is widened out to fit into a socket in the end of the shaft. The thong which is wrapped around the head is also securely fastened to the foreshaft at its middle and looped at the other end, to be spliced on to the long line for securing the game. (Cat. No. 88803, U.S.N.M.)

Captain Cook draws attention to the barbed harpoons on Cook Inlet, made of fir, about 4 feet in length. They are mentioned here to mark the northern terminus of the unilateral barb, but they will be described fully later on. One end is formed of bone, into which, by means of a socket, another small piece of bone, which is barbed, is fixed, but contrived in such a manner as to be put in and taken out without trouble. This is secured to the middle of the stick by a strong, though thin piece of twine composed of sinews. These darts are thrown with the assistance of a thin piece of wood 12 or 14 inches long. The middle of this is slightly hollowed for the better reception of the weapon, and at the termination of the hollow, which does not extend to the end, is fixed a short, pointed piece of bone to prevent the dart from slipping. The other extremity is furnished with a hole for the forefinger, and the sides are made to coincide with the other fingers and thumb in order to grasp with greater firmness.¹

The Chilkotin Indians in western Canada spear salmon with a double-headed toggle harpoon. The shaft is a long pole, upon the inner end of which are spliced two short pieces of wood which serve as foreshafts. The head of the harpoon is made of three separate pieces, the point or spike and two flukes or spurs, all securely lashed together in such a way that a cavity is left in the base for the end of the foreshaft. The

¹Second Voyage, III, p. 14.

line is tied at its ends around the heads, just above the flukes or barbs, and the middle of the line is securely held in place near the end of the shaft by a lashing of line. When the salmon is struck the toggle is fastened in the animal's body and is withdrawn from the ends of the foreshaft. The short line between the head and the shaft enables the fisherman to play with the victim and to land it more successfully.¹ Similar toggle heads on a bifurcated shaft are to be seen among the Thompson River Indians of British Columbia. This weapon is used for harpooning salmon from the shore while they are running. The handle is 15 feet or more in length and has two prongs securely spliced on to the end of the shaft (fig. 22). The Thompson River specimen is similarly made up of three pieces, the point and the two spurs, but these last do not bend outward, as in the Chilkotin example, but lie close against the foreshaft, leaving a narrow cavity to fit over the end of the latter, which is whittled in the form of a wedge. The line or leader which holds these two barbs to the front end of the shaft is braided, and the ends are caught under the lashing by means of which the toggle is built up. James Teit says that when the fish is struck the barb points are detached, and the fish, with the toggle in its body, is hauled ashore by means of the line. In some forms of the spear the whole foreshaft is detachable. There are also examples in which only one toggle head is used, and there are also spears with fixed heads. In that case the weapon is thrust through the body of the fish.² Batchelor figures a similar double-headed toggle harpoon among the Ainu.³

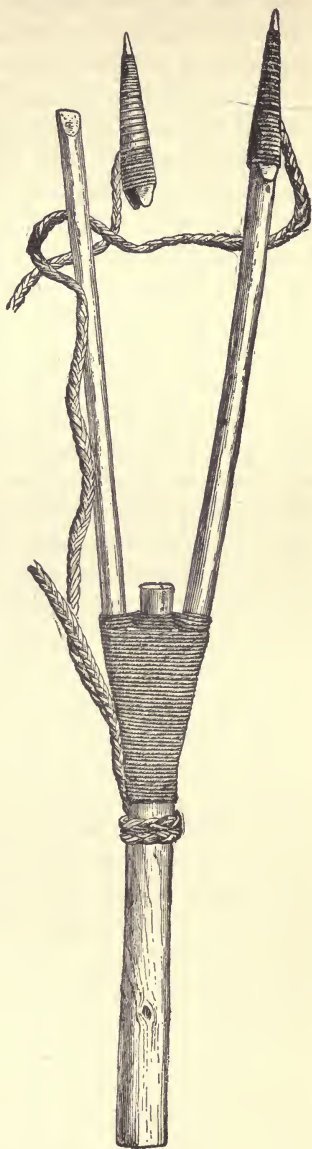


Fig. 22.

TOGGLE HARPOON.

Thompson Indians, British Columbia.

Am. Mus. Nat. History, N. Y.
After James Teit.

On the eastern side of North America it will be convenient to begin with Florida. Looking over Mr. Cushing's collections from San Marco, in the south-

¹ A. G. Morice, Notes on the Western Dénés. Trans. Canadian Institute, 1894, p. 71.

² James Teit, Thompson River Indians, 1900, p. 251, fig. 231.

³ The Ainu of Japan, 1893, p. 154.

western corner of the State, and Mr. Sawyer's drawings, made at the time they were excavated, does not reveal harpoons; but two varieties of throwing sticks were dug up. Cushing found no barbed heads. It was a great surprise to find the atlatl or spear and harpoon thrower in Florida. In 1895, when Cushing first heard of the wonderful remains at San Marco, Von den Steinen had just revealed the finding of the same implement in the Mato Grosso, Lumholtz and Seler announced its existence in northern Mexico, and the author discovered it in the cliff dwellings of the Verde. Cushing's are the central finger-hole type and the two-holed type for the fore and the middle finger. As the Gulf Stream sweeps past the Orinoco mouth, across the Caribbean sea to Yucatan, and thence in a narrower and swifter current past Florida Keys, one is not surprised to find a Mexican weapon there.

Mr. H. A. Ernst says: "The Seminole Indians of the Everglades now use white man's hooks, but adhere to the old-fashioned harpoon, which is used in catching fish and terrapin." The reader will find abundant evidence of the use of barbed harpoons in the Southern Straits in quotations from Adair, Barker, Bartram, de Bry, and Hennepin. Adair accompanied the Indians killing sturgeons in Savannah River with green swamp harpoons. These are long, sharp-pointed green canes, well bearded and hardened in the fire. When they discovered a fish they thrust into its body one of the harpoons. "As the fish would immediately strike deep, its strength was soon expended in violent struggles against the buoyant force of the green dart. As soon as the top end of the dart appeared again on the surface of the water, we made up to the fish, renewed the attack, and in like manner continued until we had secured our game."¹ These southern harpoons were of the very lowest grade, if they were worthy of the name at all. The motives for devising a highly organized type did not exist.

In Rau's Prehistoric Fishing, barbed harpoon heads are figured. These were taken from mounds, shell heaps, and other remains, from Maine to Michigan. They all belong to the barbed variety, and are of the simplest kind. Three types might be said to exist in Dr. Wilson's collection in the National Museum, the sagittate, in which the barbs are equal on the two sides of the point; the forms with multiple barbs of the same number on either side; those having an uneven number of barbs on the two sides, usually two on one edge and three on the other, and those with any number of barbs on one side, as on the north Pacific coast. At the tang end barbed harpoons are divided into two classes by means of the connecting line which joins the head to the shaft, namely, the notched tang and the pierced tang. These again are further subdivided, for the notch may be only a scratching or roughening of the surface or a bulb, and the piercing may be only a small hole or

¹C. C. Jones, *Antiquities of the Southern Indians*, New York, 1873, Chapter xiv.

large opening. About the Great Lakes barbed harpoon heads are plentiful, notched and pierced.

Charlevoix describes the sturgeon spear of the Iroquois fishermen on the Great Lakes. Two men go out in a canoe, one to paddle, the other, in the bow, holding a barbed harpoon dart secured to the canoe by a long cord. Ingersoll compares this to the Columbia River sturgeon chaser. The hook is like a gaff attached to a short wooden socket fast to a line, the other end of which is tied to the canoe. The operation of catching is described by Swan.¹ On the authority of Dr. W. M. Beauchamp the barbed harpoon had a wide variation among the Iroquois and the tribes on the Great Lakes. They are, as regards their barbs, unilateral and bilateral, and as to the tang, notched, bulbed, and pierced. The bilateral and sagittate forms are earlier and in larger numbers. Recent Mohawk, Cayuga, and Seneca sites yield large specimens. Both kinds are most plentiful at the inlet of Onondaga Lake, the outlet of Oneida Lake, and near Chaumont Bay, in Jefferson County. At Brewerton more harpoon heads have been found than in all the rest of New York and, perhaps, than all the eastern United States. It is an excellent place for the work of the harpoon. The large Iroquois harpoon had only a short point. The counties in New York yielding barbed harpoons are Jefferson, Montgomery, Madison, Onondaga, Cayuga, and Livingston. They are found in village sites and camps, rarely in graves, coming out of the ashes, says Beauchamp, in fine order.

Dr. Beauchamp has made a thorough study of the bone harpoon head in the Iroquois country in New York. The reader will have to consult his Bulletin of the New York State Museum to appreciate the endless variety of forms carved out by this quick-minded race. There are pierced, bulbed, and notched bases, unilateral and bilateral barbs, wide and narrow blades, single barbs and multiple barbs, long barbs and short barbs, alternate and opposite barbs. One would require the vocabulary of the botanist for leaves to define the shapes in Beauchamp's figures.

Josselyn tells us that among the New England Indians bass and bluefish were taken in harbors and in the mouths of barred rivers, the fishermen being in canoes and striking the fish with a "fizgig," a kind of dart or staff, to the lower end of which was fastened a sharp, jagged bone with a string to it. As soon as the fish was struck the hunter pulled away the staff, leaving the barbed head in the fish's body, and fastened the other end of the string to the canoe. Thus they hauled often as many as ten great fish to the shore.

Sturgeon were taken in this way at night on the fishing banks, where they were feeding upon small fishes called lances, sucking them out of the sand. The Indian lighted a piece of dry birch bark and held it

¹Ernest Ingersoll, *The Field*, London, LXII, p. 413.

over the side of the canoe; the sturgeon, seeing this light, mounted to the surface, where it was slain and captured with a fizgig.¹

Dr. Fewkes calls attention to walrus-ivory spear points in Nova Scotia similar to those used by the Eskimo. The walrus frequented the coast of Prince Edward Island within historic times. The points are not definitely described.²

ARCTIC HARPOONS.

The Eskimo harpoons are of every variety, barbed or toggle. The dependence of the people largely on aquatic animals for food, dress, house, furniture, tools, and utensils of all sorts makes some kind of retrieving device absolutely necessary. They use the lance also most effectively, but the weak spear, with which the Indian tribes are wont to pick fish from the water, would be of little use among the Eskimo. The variety of animal life, both in size and habit, as well as differences of terrestrial conditions, have stimulated the Eskimo mind to the utmost in devising the most varied additions to what was in the beginning quite simple. Here, also, along the Arctic shore, more than in all other environments of the Western Hemisphere combined, suggestions of improvement have come from without. It is nature's pedagogic institute. More than that, harpoon heads, large and small, of most appropriate patterns, have been made by machinery and traded to the Eskimo by whalers and fur hunters. In this part of the paper the specimens will be described as they occur. The question of the derivation of each feature will then be more easily settled.

A. B. Meyer calls attention to this and says that the little toggle heads of harpoons were not invented in their present form. Semper encountered them among the Negritos of the Palanan, north coast of Luzon, for pig shooting, in the form of harpoon arrows. Meyer describes an example from Bataan, after A. Schadenberg, and figures examples from Palanan and Bataan. All of these have 3-feathered shafts, spindle-shaped loose shafts, attached to both head and shaft by a short line, and iron heads, including both barb and toggle characteristics. The barbs are sometimes at right angles to the plane of the line hole, in other examples in the same plane. In some the toggle head has a conical projection for a socket, the latter being on the end of the loose shaft. Of the last-named pattern the Eskimo examples have no parallel forms.³

The Eskimo province may be divided into the following areas or subdivisions:

Area 1. East Greenland, west Greenland, Labrador, and Hudson Bay. *

¹ John Josselyn, *Two Voyages to New England*, 1674, p. 140.

² *American Antiquarian*, XVIII, 1896, p. 6.

³ A. B. Meyer, *Die Negritos*, IX, folio series, publications of the Royal Dresden Museum, p. 14, figs. 1 and 2; pl. vi, figs. 2 and 3; pl. viii, figs. 1 and 2.

Area 2. The central Eskimo of Boas.

Area 3. The arctic Eskimo, from the mouth of the Mackenzie River, including Point Barrow and Kotzebue Sound.

Area 4. The Bering Sea Eskimo, including Bering Strait southward to Norton Sound, the lower Yukon, Nunivak Island and the mainland, Bristol Bay, and Kadiak.

EAST GREENLAND HARPOONS.

In this seemingly out-of-the-world location the harpoon is far from its original form. All specimens are toggled and iron enters surprisingly into their composition. Holm (1887) figures the different varieties in his Plates 15, 16, 29, 30, 32, 33.

The hinged lance is here also with shaft of wood, having hand rests on the sides, assembling lines of rawhide to hold the parts together, and foreshaft with flat top, from the middle of which a short cone projects. Some lances have, instead of hand rests for thrusting or hurling from the hand, the throwing stick or ajagsick. The head of the hinged lance consists of three parts, the iron blade (1), set in a shank of ivory (2), and this is fastened into a block of the same material (3), with flat base, in the center of which is a cavity just fitting over the cone on the top of the foreshaft. This block is hinged to the foreshaft by means of elastic rawhide thongs piercing it and the shaft¹ (fig. 23).

The plainest variety of east Greenland has a wooden shaft, with chisel-shaped ice pick at the end. The toggle head is of bone or ivory, with iron blade, flat, cone-shaped body, two line holes quite through the body, united by a groove on the back, into which the line sinks. The shaft socket is in the center of the base, two wing-like barbs flanking it. The complete sealing harpoon is modeled after that of west Greenland, having eyelets instead of hooks for the throwing stick, and being covered all over with little figures of animals, reminding one slightly of the Aleutian hat and the bark onlaying of the Amur people.

The barbed leisters or fish-spears, with two or more barbs, are turned by these Eskimo into a toggle arrangement quite unique in America. The piercing ends are of iron or bone and hinged as in a pair of scissors, the cutting end piercing the animal, the other end lying against the shank. When they have entered the flesh these points turn at right angles and toggle.² A most curious device is the adaptation of this hinged head to a seal harpoon, provided with a little sled on the fore end of a very long shaft. It will be seen later on that the west Greenlanders use for deep-sea fishing for seals a very long shaft worked by two men, and that the Giliaks make a harpoon shaft nearly a hundred feet long, with a float on the fore end.³

¹ Holm, East Greenland, 1887, pl. xv.

² Idem., pl. xv, *a* and *b*.

³ Schrenk, Reisen und Forschungen in Amurlände, 1881, p. 546.

A harpoon (Cat. No. 168960, U.S.N.M.) from east Greenland, presented by the Copenhagen Museum, is shown in Plate 4. While in general appearance the weapon is similar to those of the same character in southwest Greenland, the head is a type peculiar to the eastern part of the peninsula. The body is of narwhal ivory, conical in outline, a long, lanceolate blade fastened in by means of a rivet. The point of the loose shaft enters directly into the base, which is flanked by two conspicuous barbs or spurs. A strip of iron is riveted across the lower portion on either side to strengthen it. An interesting feature in this specimen is the line hole, which consists of two separate perforations, united on the back with a groove or countersunk cavity to prevent the line from chafing. The loose shaft, which has been neatly spliced at the upper end, has a flat surface at the base, with a projection in the middle, fitting into a cavity on the front of the foreshaft, and the two are tightly hinged together by means of a lashing of elastic rawhide. The use of this joint has been elsewhere explained. The foreshaft is in this specimen a cap of ivory, squared off on top, and the middle left projecting for the socket on the base of the loose shaft. The shaft is of wood, and has on its surface the following attachments: A knob of ivory at the lower end, three hooks or pegs for the throwing stick, one to catch into its base or working end, and two near each other fitting into holes in the manual end of the throwing stick, as seen in the figure. Near these pegs is a hook of ivory, over which fits a catch of the same material on the line, serving to hold the toggle head firmly upon the top of the loose shaft when the weapon is set ready to be plunged into the body of the animal. The throwing stick has a perforation at the

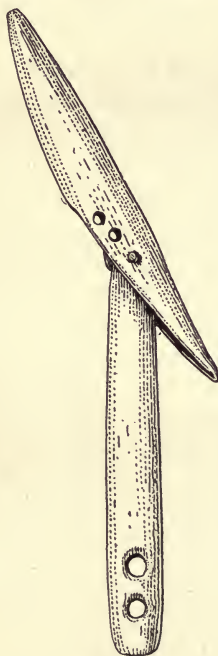


Fig. 23.

HINGED TOGGLE HEAD.

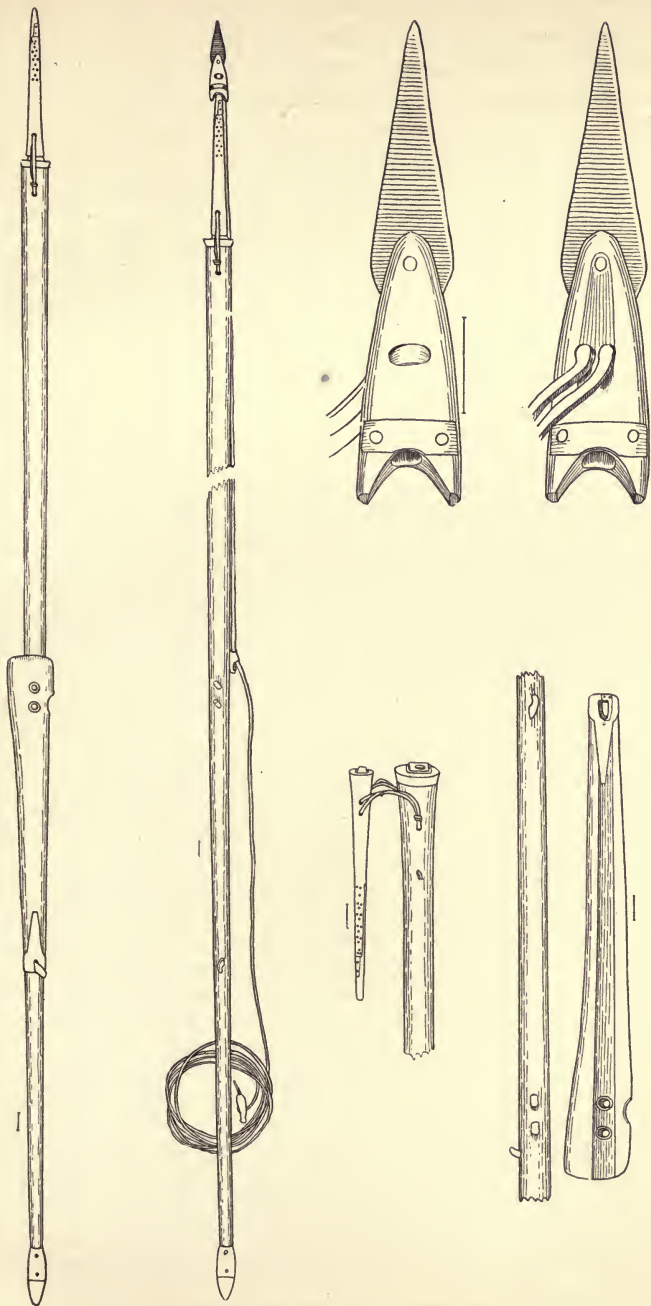
East Greenland.

After Gustav Holm.

working end instead of a peg. The line of rawhide is fastened immediately into the head of the harpoon and has a toggle at the other end to be attached to the line of the float. The other accessories to harpoons of this class are to be seen in Plates 14, 15, and 16 of Holm (1887).

WEST GREENLAND.

The oldest accounts of the Eskimo refer to those of Greenland and Labrador, but some of their apparatus remains quite primitive. Again, in a preliminary work like this the area can not be accurately subdivided. The natives themselves are fond of wandering about, and



TOGGLE HARPOON, EAST GREENLAND.

Gift of Copenhagen Museum.

Cat. No. 168960, U.S.N.M.

they leave their ideas as well as their accouterments. The task of discrimination is further embarrassed by the collector's unfortunate habit of labeling a specimen with the name of the place where he procured it, himself frequently not knowing the place of its manufacture. The numbers on the specimens are arranged as they occur in the catalogue of the U. S. National Museum.

Hans Egede, the apostle to Greenland (1721-1736), gives the following description of the harpoon and its uses:

When the Indians of Greenland go whale catching they put on their best apparel, fancying that if they did not come neatly dressed the whale, who can not bear slovenly habits, would shun them. About fifty men and women set out in one of the large boats called *kone-boats*. The women carry along with them their sewing tackle, consisting of needles and thread; to sew and mend their husbands' spring coats should they be torn, and also to mend the boat in case it should receive any damage. The men go in search of the whale, and when they have found it they strike it with their harpoons, to which are fastened lines or straps 2 or 3 fathoms long, at the end of which they tie a bag of a whole seal skin filled with air; so that when a whale finds itself wounded and runs away with the harpoon it may the sooner become tired, the air bag hindering it from being long under water. When it thus loses strength they attack it again with their spears and lances until it is killed; then they put on their spring coats, made of dressed seal skin, all of one piece, with boots, gloves, and caps, sewed and laced so tight together that no water can penetrate them. In this garb they jump into the sea and begin to slice the fat off all around the body, even under the water; for in these coats they can not sink, since they are full of air, so that they can, like the seal, stand upright in the sea. They are sometimes so daring they will get upon the whale's back while there is yet life in him, to cut away the fat.

They go much the same way to work in killing seal except that the harpoon is lesser, and to it is fastened a line 6 or 7 fathoms long. At the end is a bladder or bag made of a small sealskin filled with air, to keep the seal, when he is wounded, from diving under water and being lost again. In the northern parts, where the sea is frozen over in the winter, the Eskimo use other means. They first look out for holes which the seals make with their claws, about the size of a half penny, that they may catch their breath. After they have found a hole they seat themselves near it upon a chair made for the purpose, and as soon as they perceive the seal come up to the hole and put its snout into it for air, they immediately strike it with a small harpoon to which is fastened a strap a fathom long, which they hold in the other hand. After it is struck and can not escape, they cut the hole so large that they may get the animal up through it, and as soon as they have its head above the ice they can kill it with one blow of the fist.

A third way of catching seals is to make a great hole in the ice, or in the spring they find holes made by the seals. Near to these holes they place a low bench upon which they lie down upon their bellies, having first made a small hole near the larger one, through which they let softly down a perch 16 or 20 yards long, headed with a harpoon, a strap being fastened to it which one holds in his hand, while another, who lies upon a bench with his face downward, watches the coming of the seal, when he cries "*Kae*," whereupon he who holds the pole pushes and strikes the seal.

The fourth way is this: When the seals, in the spring, are lying upon the ice near holes which they themselves make to get up and down, the Greenlanders, clothed in sealskin, holding harpoons in their hands, creep along upon the ice, moving their

heads backward and forward and snoring like a seal till they come so near them that they can reach the animal with their harpoons and strike them.¹

The Greenlanders, says Nansen, use two forms of the great harpoon: (1) the Unak, with butt end finished in a bone knob; it is longer and slighter than (2) the Ernangnak, having on its butt end two feathers of bone, commonly whale rib, to increase the weight and guide the flight.² The line is made of young walrus (*Odobænus rosmarus*) or of bearded seal hide (*Phoca barbata*), from 15 to 18 yards long and one-fourth inch wide. The float is the skin of a young ringed seal (*Phoca fetida*) taken off whole, the hair removed, the apertures all tied up, and the whole dried. The line is coiled on the kaiak stand.³ He calls the great Greenland and Hudson Bay harpoon, thrown from the hand without the throwing stick, Sigagut. In the work above referred to a spirited description of the harpoon and its accessories will be found (pp. 62-64), with figures.

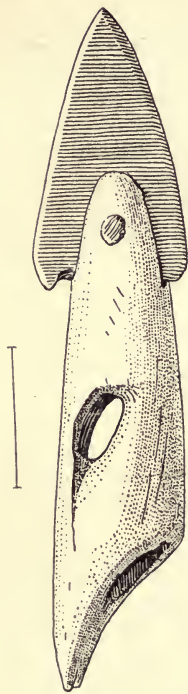


Fig. 24.

TOGGLE HEAD.

West Greenland.

Collected by S. F. Baird.
Cat. No. 9836, U.S.N.M.

Before giving in detail the structure of the western Greenland harpoon, attention must again be called to the difficulty of making neat distinctions. Recent explorations by Peary especially assign Smith Sound material to the Central Eskimo; at least it is intermediate. The constancy of iron in the oldest specimens also demands that no hasty conclusions be drawn concerning the original Eskimo harpoon, either as to its design or ornamentation.

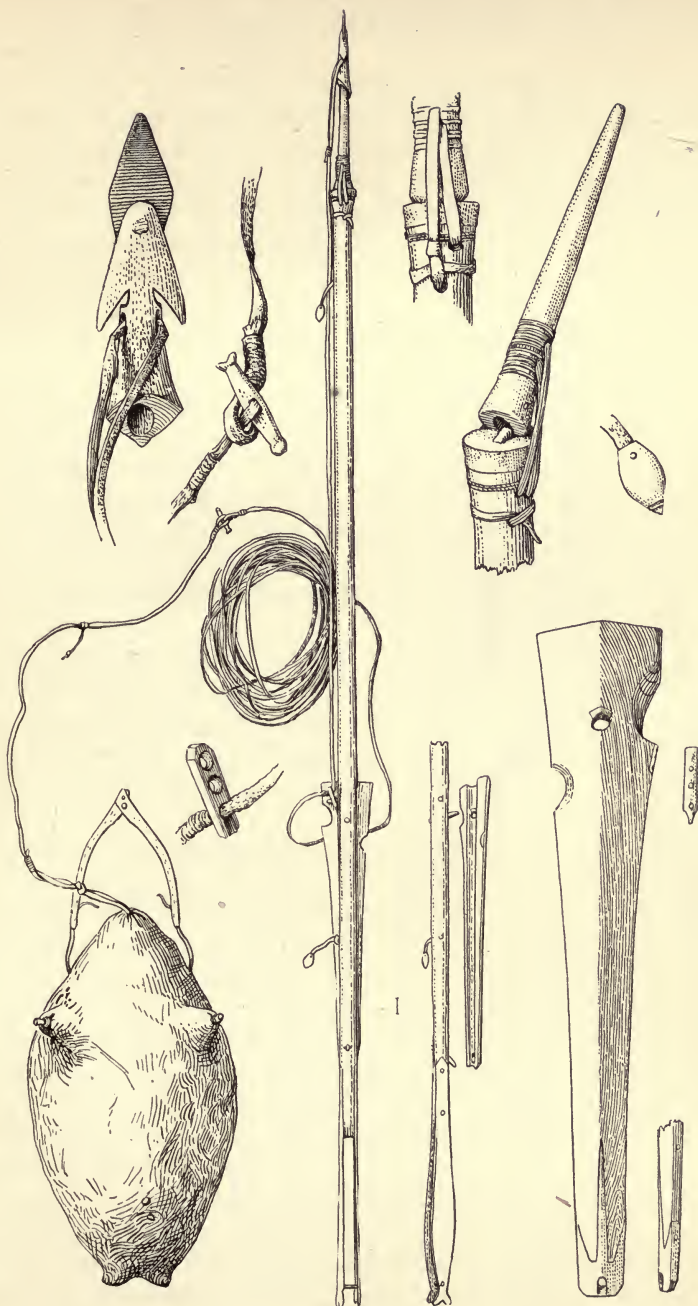
A toggle head from Greenland (Cat. No. 9836, U.S.N.M.), with a triangular blade of iron slightly barbed on one corner, fastened into the slit by a rivet of iron, is shown in fig. 24. The body is conical; the line hole is cut across the body and across the plane of the blade. It is an elliptical opening, and its diameter is not in a line with the axis of the body. It has one spur for a barb, and the socket for the foreshaft is wide and shallow. It is the gift of S. F. Baird.

A modern toggle head of a whale harpoon (Cat. No. 19510, U.S.N.M.), from Greenland, is seen in fig. 25. This unfinished specimen shows the last step in the development of the machine-made toggle head. Everything about the specimen demonstrates this—the mathematical form, the saw cut for the blade, the socket for the foreshaft, the angular barb, and especially the large line hole cut straight across the body of the toggle head. In the primitive examples this last feature cost

¹ Egede's Greenland, pp. 102-106.

² Nansen, Across Greenland, 1893, p. 37.

³ Idem., p. 33.



SEAL HARPOON FROM WEST GREENLAND.

Collected by N. P. Scudder.

Cat. No. 35670, U.S.N.M.

the maker a great deal of trouble. He had to bore two holes slanting toward each other and meeting inside, to unite these by removing the rough surface, and to separately prepare grooves to receive the line. This is the gift of J. H. Clark.

Plate 5 in the U. S. National Museum is a complete seal harpoon from west Greenland (Cat. No. 35670). The head is a combination of barb and toggle, sagittate in outline, with a slender waist and wide base; a very gracefully-made specimen. The blade is rhomboidal, but squared off in the saw cut and riveted with iron. The oblong line hole passes straight through the waist and has slight line grooves.

There are three barbs. Those on the side are angular, prominent, and sawed out, so as to present three flat surfaces inside; the terminal barb angular, formed by the two sloping faces of the back and the beveled surface of the butt; socket for the end of the foreshaft narrow and clean cut. The butt end has no bend or curve in it, but is formed by a single cut in the same plane.

The line is drawn through the line hole, bent, and the end fastened down 6 inches from the toggle head, and held fast by a seizing of sinew three-ply braid, laid on for an inch in half hitches.

At a distance of 50 inches from the toggle head is an eyelet of bone, $1\frac{1}{2}$ inches long and half an inch wide, having rectangular outline and pierced with three holes, through one of which the line runs. Just beyond this eyelet is a wrapping of sinew string acting as a stop. The whole line is over 30 feet long and terminates in a toggle of reindeer antler, with a knob at one end and a bifurcation at the other end. This is to hook into a loop in the line of the float, to be now described.

The hide of a young seal was drawn off over the neck, care being taken to keep the legs and other parts complete. After being turned right side out, the hide was sweated, depilated, and again turned wrong side out and all openings carefully fastened up air-tight. But into the puckered orifice of the neck a stout rawhide loop was inserted and made fast and into one forefoot a bone mouthpiece was firmly lashed. About

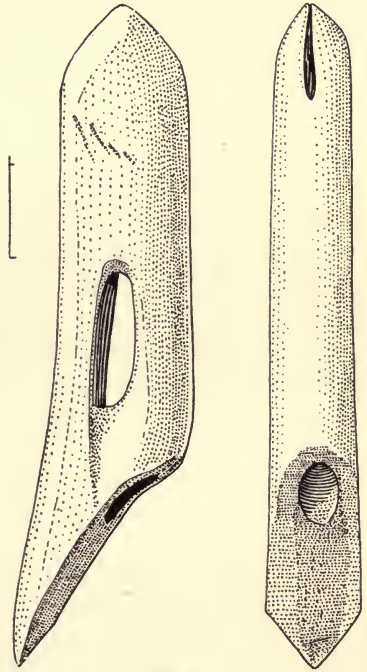


Fig. 25.

TOGGLE HEAD.

West Greenland.

Collected by J. H. Clark. Cat. No. 19510, U.S.N.M.

this specimen, as on many other floats, little holes were stopped by studs of wood or hard animal substance, set in when the hide was green, which, shrinking, renders the joint perfectly tight. As mentioned, into the puckered neck of the float was knotted a bend or loop 6 inches long. This would serve as a handle and be inseparable from the float. A stout piece of rawhide line, 3 or 4 feet long, was bent to form a loop at each end. Into one loop the float-loop was spliced, and into the one on the other end of the line the toggle of the harpoon line hooks. The bends in the ends of the short float line are seized down by means of sinew braid in half hitches. The float is always associated with the kaiak, and therefore it has attachments for it, as well as for the line. In the end of the float, where the float loop is fastened, and on either side of the latter, two short rawhide lines are inserted and made fast on the inside. These short pieces are run into the ends of a device, made from two pieces of antler, for slipping under one of the cross lines on the deck of the kaiak. For this purpose a hole was bored up in the end of each one of these pieces 1 inch, met by a hole bored half way in at the side, and half an inch above another hole was bored quite through. The line from the float is drawn up the hole at the end, out at the meeting hole, and through the upper hole, where it is fastened with a peg, the two holes being united on the outside by a countersink to prevent abrasion by ice. A wooden peg wedges the line fast in the inner hole. The two front ends of the pieces of antler are united by an iron rivet. These details are mentioned to call attention to the cunning makeshifts of savages working with the poorest tools. The maxim, "Where there's a will there's a way," is quite true among the Eskimo.

The shaft is a typical Greenland form and consists of loose shaft and rawhide hinge or connecting line, foreshaft, shaft, and "feathers."

The loose shaft is an elongated cone of ivory $7\frac{1}{2}$ inches in length, having at a distance of 1 inch from the butt a raised ornament of rings and bands turned as in a lathe, the middle band with cross ridges. Two holes are bored, one above the other, through this ornament, and three holes through the fore end of the wooden shaft for the rawhide thong that forms the elastic joint between loose shaft and foreshaft. This thong is doubled at its widest end and the whole drawn through one of the shaft holes, not tightly; it passes (1) through the lower hole of the loose shaft, (2) back through a hole in the shaft, (3) up through the outer hole in the loose shaft, (4) back through the loop in the first end, then through the third hole of the shaft and once wrapped around, the end being tucked under as in making a single knot after the whole is drawn as tight as possible.

The base of the loose shaft is squared off and socketed. The foreshaft is only half an inch long, but forms an ellipse $1\frac{1}{2}$ by $1\frac{1}{4}$ inches in diameter. It has a pivot or projection on top to fit into the socket of

the loose shaft and is excavated below to fit over a tenon in the end of the wooden shaft, which is kept from splitting by a wrapping of sinew twine.

The shaft, of pine wood, 5 feet 2 inches long and $1\frac{1}{2}$ inches thick, tapers somewhat toward the butt end. Upon it are the following additions: Buttons for holding the shaft on the kaiak, peg over which the eyelet on the line catches to hold the head on the loose shaft, two pegs for the throwing stick, and bone feathers.

The buttons for holding the apparatus on the kaiak are two little almond-shaped bits of ivory, attached to the shaft near either end by means of a short rawhide thong. These buttons are tucked under the cross lines on the deck of the kaiak, but on occasion do not offer any ratchet to prevent withdrawal. The throwing stick pegs for the two holes in that apparatus are of bone and extend quite through the shaft near either end. The west Greenland shaft for the seal harpoon is unique in having the pegs on the shaft and not on the throwing stick.

The butt end of the shaft is squared for the attachment of the two "feathers" carved from whale's bone. The end of the shaft is beveled off and grooved.

It must be borne in mind that as a rule the North American Indians have three feathers on their arrows, radiating outward; the Eskimo have two, laid flat on the flat shaftment. Now on the west Greenland smaller harpoon, at either side of the butt, is a strip of whale's bone 16 inches long, from $1\frac{1}{2}$ inches wide, and one-eighth inch thick, both exactly alike, with long leaf-shaped outline terminating in a fish-tail bifurcation. These two plates are pegged on for 5 to 6 inches, so that their outsides are flush with the shaft, and their butt ends are held apart in place by an ivory peg or cylinder. The area of this device or attachment is very circumscribed. It is not shown by Boas, Kumlien, or Turner. The throwing stick is of light, coniferous wood, very broad in the manual part and tapering gracefully toward the working end. The top is slightly rounded up, the bottom of two surfaces meeting in a ridge along the middle. The shaft groove is an inch wide and from one-fourth to one-eighth inch deep, extending the entire length of the piece. It is right-handed, having a deep under-cut notch on the left margin for the thumb, just back of which on the margin is a pretty bit of bone pegged on. The hole in the manual part for the peg has in front of it a washer of bone set in to prevent the peg from wearing the hole larger. Into the working end of the throwing stick is neatly set a T-shaped bit of whale's bone, held in place by pegs quite through both bone and wood. At the outer end of this bone is a large hole slanting forward and into it the rear peg on the shaft fits. When pulled straight ahead the hook holds firmly, but when the throwing stick begins to turn away from the shaft the hole unhinges from the peg. All this action with least resistance is provided for in the device. Collected by N. P. Seudder.

A flat toggle head (No. 45855, U.S.N.M.) with a gibbous section has the back more compressed than the belly. The front end is rounded, the blade slit not deep, and rivet hole large. The line hole is curved upward and has deep line grooves. Barbs, two on the outer margins, formed by a slightly incurved cut into the butt end. The butt is whittled away so that the toggle head is just as long on the belly as on the back. Length, 3 inches. Gift of the Copenhagen Museum. Example 63951, gift of Governor Fenckner, is somewhat similar, but

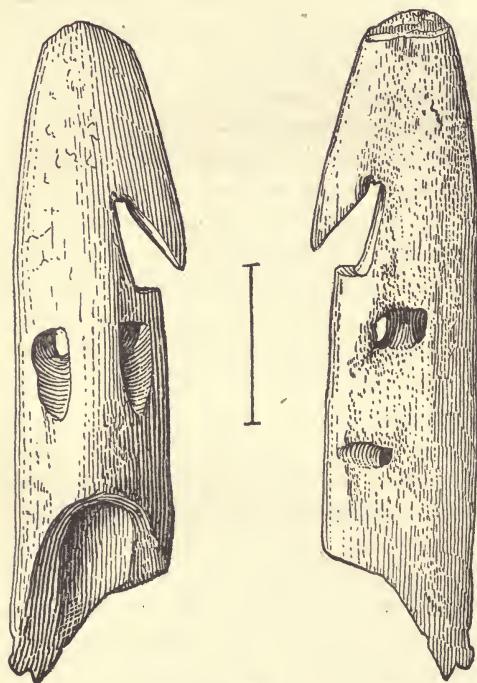


Fig. 26.

TOGGLE AND BARBED HARPOON HEAD.

West Greenland.

Gift of Copenhagen Museum. Cat. No. 45883, U.S.N.M.

the back is longer and the notch between the tips of the barbs is not angular.

Example No. 45670 in the U. S. National Museum is the point of a large harpoon from Greenland. The blade, of iron, was inserted in a saw cut in the end of the shank and riveted with iron, now decayed by rust. The shank, of whale's rib, is rectangular in the section at the front and circular in other parts. Between the rectangular and circular portions are four barbs. At the angles the butt end is conical to fit into a socket. In the end of the shaft, 3 inches above, two holes are pierced for the insertion of a thong forming a hinge between the loose shaft and the shaft. Total length, 15 $\frac{3}{4}$ inches. Gift of the Copen-

hagen Museum. No. 63939 is a broken and unfinished specimen of the same type.

Example No. 45872 in the U. S. National Museum is the loose shaft and point of a barbed harpoon combined, from south Greenland. The front end is furnished with two barbs on one side and the top is pointed. The butt end is cylindrical to fit into the foreshaft, and 2 inches above it are three holes bored for the rawhide thong which attaches this part to the shaft. The noticeable feature in this old piece is the presence of the barbs on the loose shaft and the entire absence of toggle attachments. Length, 14 inches. Gift of the Copenhagen Museum.

Fig. 26 is a combined toggle and barbed harpoon head from western Greenland (No. 45883, U.S.N.M.), all in one piece of antler. The body is narrow and flat, the spongy part of the material being the back of the implement, while the belly, which takes the strain of the line, is the outside hard portion of the antler. For a blade, the fore end was sharpened to a point. There is no evidence of a metal blade having been used in this head. The line hole is formed by two slanting holes meeting on the back of the body, so as to leave a small opening on the back, a feature not common in Greenland specimens, but observed in many from the Amur region (Plate 7). The line grooves extend only half an inch backward, and then suddenly terminate. Originally there were doubtless three barbs; one, a strong hook on the left-hand margin between the point and the line hole, and two barbs at the butt, spread out like a fish tail, the tips being cut in an ornamental manner (see Plate 8, from Von Schrenk). The socket for the foreshaft is only three-fourths of an inch deep. The butt end is cut off with a long bevel, steep on its lower half and sloping more and more outward. Length, $4\frac{1}{4}$ inches. Collected by Dr. Emil Bessels, but special locality not given.

A toggle head of bone from western Greenland (No. 45884, U.S.N.M), conoid in form and double convex in section, is shown in fig. 27. The blade, which was of metal, is wanting, and the blade slit is wide for such a small specimen, the rivet hole neatly bored. Line hole, of two cone-shaped cavities, meeting in the body of the implement, and having slight line grooves. There is but one barb, pointed on the back, a little to the right-hand side of the middle. The socket for the end of the foreshaft is cone-shaped. Length, $2\frac{1}{2}$ inches. Gift of the Copenhagen Museum. This specimen, though exceedingly plain in shape, does not mark an early form of toggle harpoon head, but a later period, when they were made in great numbers, sometimes by machinery, and sold to the Eskimo, who found it easier to provide themselves in this way than to make them by their rude tools.

An old toggle head of a harpoon from north Greenland (No. 45885, U.S.N.M.), collected by Emil Bessels, is shown in fig. 28.

The body is of bone, the back nearly flat, being the soft part of the material, and the belly, which is more rounded, is of the outer, hard part of the bone, this being necessary in order to take the strain of the line.

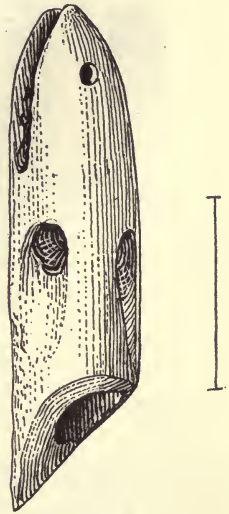


Fig. 27.

TOGGLE HEAD.

West Greenland.

Gift of Copenhagen Museum.

Cat. No. 45884, U.S.N.M.

The blade in this example is missing, and was inserted in a saw cut at the rounded end of the body and held in place by a rivet.

The shaft socket is a conical hole centered between the back and the front surfaces and flanked by barbs whose points are formed by the meeting of the back, the belly, and the socket or excavation in the rear for the foreshaft.

The line hole is formed by the meeting of two holes bored in from the under side and not quite through to the top. Line grooves project backward from the line hole so as to render all smooth to prevent the thong from chafing. Length, $2\frac{1}{2}$ inches.

A combined barbed and toggle head (Cat. No. 45886, U.S.N.M.) from west Greenland is shown in fig. 29, and is a gift of the Copenhagen Museum. The body is of bone, the back being formed of the hard or outside portion. The kerf for the blade is wide, and the latter, missing in this specimen, was fastened in with a rivet. On either side of the blade

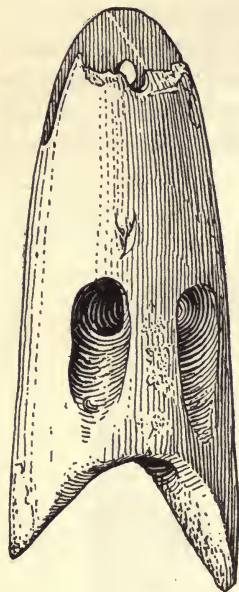


Fig. 28.

OLD TOGGLE HEAD.

North Greenland.

Collected by Emil Bessels. Cat. No. 45885,
U.S.N.M.

are two marginal barbs, cut out squarely as with a saw; from the tang of these barbs the body widens out to the tip end of the spur or flukes. The line hole is formed by two distinct conical bores, which meet at their inner extremities, forming at the same time a continuous cavity and line grooves. The butt is bifurcated, and the cavity for the end of the foreshaft seems to have been bored out after the barbs were formed. This fine old piece is worthy of note in that both types of harpoon head, the barbed and the toggle, are preserved. The specimen represents also what Murdoch considers to be the original form, since the barbs, the blade, and the line hole are in the same plane, while in the better and more improved varieties the blade is set in at right angles to the line hole.

A barbed harpoon head of bone (Cat. No. 45887, U.S.N.M.), all in one piece, from northwestern Greenland, is shown in fig. 30. It is

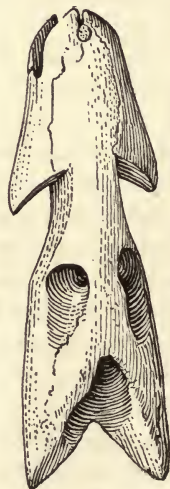


Fig. 29.

OLD BARBED AND TOGGLE
HEAD.

West Greenland.

Gift of Copenhagen Museum.
Cat. No. 45886, U.S.N.M.

shaped like a barbed and tanged arrowhead, with a line hole through the tang in the plane of the blade. The tang abuts squarely on the end of the shaft and the front of the blade is sharpened to an edge. The barbs are not of equal length. Length, $1\frac{1}{4}$ inches; width, $1\frac{5}{8}$ inches. From Greenland. Collected by Dr. E. Bessels.

Cat. No. 45888 (Fig. 31) is a barbed head of whale's rib, but there is not enough remaining to indicate whether it had toggle attachments. Length, $4\frac{1}{4}$ inches. Gift of Copenhagen Museum.

These old pieces are most interesting connecting links between the simple barb and the toggle head. They might be named conservative harpoon heads, which, while trying the new device, can not at once lay the old barb aside.



Fig. 30.

BARBED HARPOON HEAD.

Northern Greenland.

Collected by Emil Bessels. Cat. No. 45887.
U.S.N.M.

Fig. 31.

OLD HARPOON HEAD.

North Greenland.

Gift of Copenhagen Museum. Cat. No.
45888, U.S.N.M.

A toggle harpoon head (No. 45889, U.S.N.M.) from western Greenland, made of bone all in one piece, is shown in fig. 32. It is double convex in section and the point is formed by shaving down the faces of the body. The line hole passes through the bone in a direction perpendicular to the plane of the blade, and the single barb is formed by beveling the end. The line grooves are slight, and the cavity for the shaft large, its margin continuous. Length, $5\frac{1}{2}$ inches; width, one-half inch; depth, fifteen-sixteenths inch. Gift of the Museum of Ethnology, Copenhagen. An entirely aboriginal form, with no metal about it. From this it is not to be inferred that the piece antedates the coming of the whites.

The loose shaft of a toggle harpoon (Cat. No. 45893, U.S.N.M.), made of wood, from south Greenland, deserves consideration. It is spindle-shaped, elongated on one end, and short at the other, elliptical in cross section. Through the thickest portion two holes are bored for the rawhide thong which unites it to the shaft. Examples of this part of the harpoon in wood are very rare. Length, $9\frac{1}{2}$ inches. Gift of the Copenhagen Museum.

An ancient barbed and toggle harpoon head (Cat. No. 45910, U.S. N.M.), made from a bit of hollow bone, from northern Greenland, collected by E. Bessels, is shown in fig. 33. The point has been cut off so that it is impossible to say how the blade was set on. The barbs on

the margin in front of the line hole have been cut out squarely but their points have evidently been reduced. It is possible, however, that their present form represents nearly the shape of the original material. At this point it is proper to make an observation which applies very largely to the forms of aboriginal implements. The savages understood how, in an emergency, to secure the largest amount of result with the least amount of effort. It is with inventions as with language. A long word is not employed when a shorter one will suffice, and a servile imitation of any type specimen is not attempted when the result can be reached more directly. Hence, while objects of a certain class resemble one another in general, no two are alike in detail. The line hole is cut through the soft part of the bone by two conical perforations meeting in the middle, and the line grooves appear to have been made by the same instrument.

The back of the body of this toggle head is very hard bone, and the spur bends upward and outward, following the natural curve of the material. The base is cut off by a nearly plane surface. The socket for the fore-shaft is a cylindrical hole bored straight into the bone from the rear, apparently with an instrument of iron. It is not conical as in the great majority of Eskimo harpoon heads.

A toggle harpoon head, made of antler (Cat. No. 45947, U.S.N.M.), from north Greenland, the gift of the Copenhagen Museum, is shown in fig. 34. It is in the form of a flat cone with convex sides. The kerf or saw cut is wider than in the more modern examples, because the blade was of stone and held in place by a rivet of bone. The line hole is most primitive

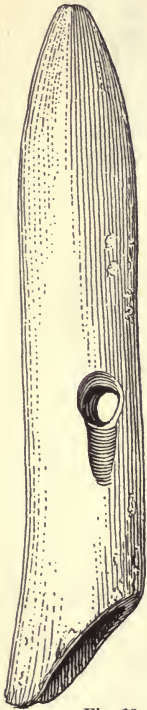


Fig. 32.

TOGGLE HEAD.

West Greenland.

Gift of Copenhagen Museum.
Cat. No. 45889, U.S.N.M.



Fig. 33.

OLD BARBED AND TOGGLE
HEAD.

West Greenland.

Collected by Emil Bessels. Cat.
No. 45910, U.S.N.M.

and interesting, being formed, not by a sloping cavity, but by means of a drill. The socket at the base is also conical, opening into the line hole, and two barbs of equal size are formed by cutting away the material of the back. This bifurcation is found on many Greenland specimens. Those who are acquainted with the Eskimo handicraft in localities where steel tools do not abound are interested to note what free and varied use these natives make of drills of different sizes. There are twenty examples of boring on this little toggle head, for the rivet, for the line hole grooves and socket, and besides for mending a crack in the material. For this last purpose we have not only perforations for the sinew mending, but gutters bored one twenty-fourth of an inch deep, into which the cord was countersunk. This will be better seen by an examination of the illustration.

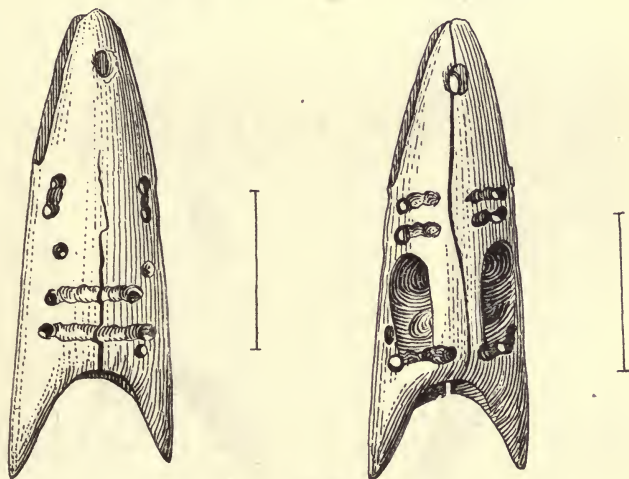


Fig. 34.

OLD TOGGLE HEAD.

North Greenland.

Gift of Copenhagen Museum. Cat. No. 45947, U.S.N.M.

The point of a barbed harpoon (Cat. No. 63938, U.S.N.M.), from Greenland, must be mentioned. The point is arrow-shaped, symmetrical, with two barbs. The tang is spindle-formed, with a cone at the butt end and pierced in two places for the insertion of the line connecting with the shaft. Length, $5\frac{1}{4}$ inches. Gift of Governor Fenckner.

Similar to this is Cat. No. 63937, U.S.N.M., an old specimen from the same locality. These examples have their counterpart in the numerous points of the small barbed seal harpoon of the western Eskimo.

An old barbed and toggle harpoon head (Cat. No. 63940, U.S.N.M.) from west Greenland, the gift of Governor Fenckner, is shown in fig. 35. The material is bone. The blade is wanting, and the blade slit has been cut away. There are three rivet holes, and one of them,

seen on the right side of the left-hand figure, is double. The barbs on the margin are cut out square, as with a saw, but the sides of the tang are curved in, leaving shoulders at their base, from which point the body curves outward to the end of the spurs. The line hole is formed, as in most examples of this kind, by two independent conical bores which meet at their inner point. Line grooves are connected with these. The base is not cut off in a plane surface, but has the appearance of being scooped out, beginning on the under side with a perpendicular surface, which slopes more and more toward the

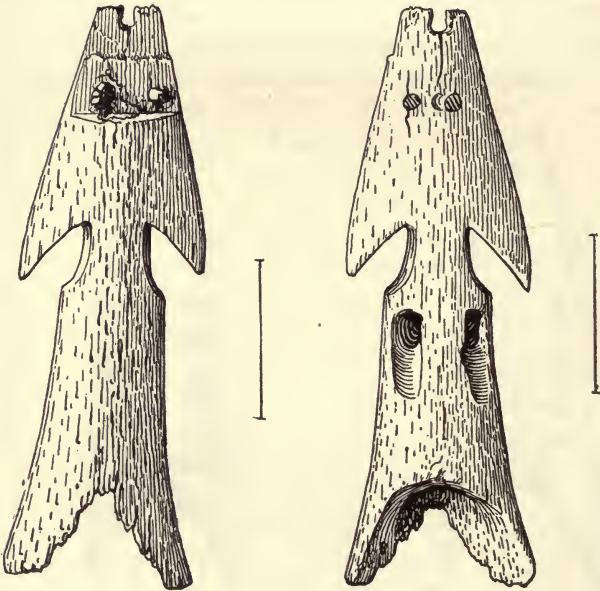


Fig. 35.

OLD BARBED AND TOGGLE HEAD.

West Greenland.

Cat. No. 63940, U.S.N.M.

horizontal as the ends of the barbs are approached. This specimen is noteworthy for conserving the two types of harpoon heads in one, the barbs on the sides, and the toggle.

A combined barbed and toggle harpoon head (No. 63941, U.S.N.M.) of antler from Greenland is represented in fig. 36. It is rhomboid in cross section, sagged downward in the middle, and delicately made. The blade, of iron, formerly present, but now wanting, was held in place by a rivet. The line hole, formed by the meeting of two excavations, is curved, but not visible on the back. Line grooves short and whittled out. Barbs, three—two in front of the line hole and one at the butt. The barbs on the margin in front are sharp and prominent for such a small specimen, the cut of each being three-sided. The rear barb is cocked up and pointed, and its edges ornamented each with

two crenate notches. Butt cut off at a sharp angle, nearly in a single plane; socket wide and shallow. Between the line holes and the socket is an ingenious combination of perforations and gutters for repairing. Length, $3\frac{3}{4}$ inches. Gift of Governor Fenckner, of Greenland.

Of this same type and pattern, but ruder, is Cat. No. 45910, from Greenland, made of bone, and somewhat dilapidated. The hard bone forms the back, and the excavations on the belly are in the spongy portion; the reverse of this is usually true. The slight barbs on the edges are quite squarely sawed out and the single barb at the rear much bent upward. Length, $3\frac{3}{8}$ inches. Gift of the Copenhagen Museum.

A combined barbed and toggle head (Cat. No. 63942, U.S.N.M.) from Greenland, made of bone, is shown in fig. 37. Body

flat on the belly, and conformed to the shape of the material on the back; an unwise method, because in this case the spongy tissue has to take the strain. Separate blade, none, the material being sharpened to a point and edge.

Line holes small, set at an extraordinarily acute angle to each other and barely continued through to the back. Line grooves scarcely visible. Barbs, four—two broad, angular teeth in front, one on either side, and two angular toothed projections behind. Socket shallow and wide. Butt end gouged or dished out, so as to give free play to the loose shaft, and leaving the barbs, looking from the under side, like a pair of fins. Length, 4 inches. Collected by Governor Fenckner. With this example should be compared Nos. 63940 and 45886—

the former of whale's rib, the latter of antler. Both these examples are of the same general pattern, but have had iron blades. It should be noted as a local peculiarity that the former has a three-sided notch at the front barbs, the latter only a two-sided notch.

A toggle head of ivory (Cat. No. 63943, U.S.N.M.) from Greenland,

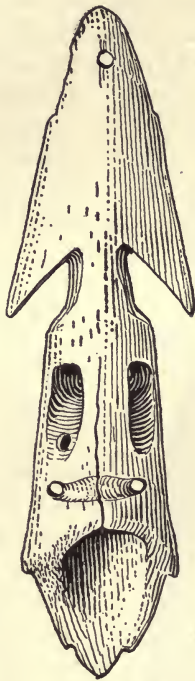


Fig. 36.

BARBED AND TOGGLE HEAD.

West Greenland.

Gift of Governor Fenckner. Cat. No. 63941, U.S.N.M.



Fig. 37.

BARBED AND TOGGLE HEAD.

West Greenland.

Gift of Governor Fenckner. Cat. No. 63942, U.S.N.M.

in shape of a compressed cone, elliptical in section, narrow and sharp at the point, is shown in fig. 38. The blade, of iron, is much rusted and held in by an iron rivet. Line hole straight through the sides in a plane parallel to the blade. Line grooves short and slight. There is one barb terminating the back, but slightly bifurcated. The socket for the foreshaft is wide and shallow and the butt end whittled off with a slight incurve. Length, $3\frac{5}{8}$ inches. Gift of Governor Fenckner.

Example 63944 is broken, but similar, the butt-end curve being deeper and the tip not bifurcated (fig. 39).

A toggle harpoon head (Cat. No. 63945, U.S.N.M.)

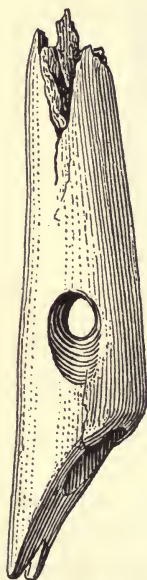


Fig. 38.

TOGGLE HEAD.

West Greenland.

Gift of Governor Fenckner.
Cat. No. 63943, U.S.N.M.



Fig. 39.

OLD TOGGLE HEAD.

West Greenland.

Gift of Governor Fenckner. Cat.
No. 63944, U.S.N.M.



Fig. 40.

OLD TOGGLE HEAD.

West Greenland.

Gift of Governor Fenckner. Cat. No. 63945,
U.S.N.M.

from Greenland, made of bone and iron, is shown in fig. 40. The body is conoidal, the hastate iron blade being inserted into a saw cut in the pointed end and held by a copper rivet. The line hole lies parallel to the plane of the blade; line grooves slight. The barb is bisected by the plane of the blade, as in many older specimens, but this sets the line hole perpendicular and entirely on the right face of the body. It is possible that the specimen had formerly two barbs. Shaft cavity cut off square below, the spur-like barb extending back-

ward and upward. Length, $3\frac{1}{2}$ inches; width or thickness through line hole, seven-eighths inch; depth, five-eighths inch. Gift of Governor Fenckner. Similar to this specimen is Cat. No. 63949 (fig. 41), of bone, in form of a flat hexagonal prism, the point abruptly cut off. Line holes cut upward through the two lower faces. In this example the spur is on the left-hand side, if the line hole be taken as underneath. It is a little difficult to understand how such an implement would toggle and hold. Length of 63949, $2\frac{1}{2}$ inches. Greenland. Gift of Governor Fenckner.

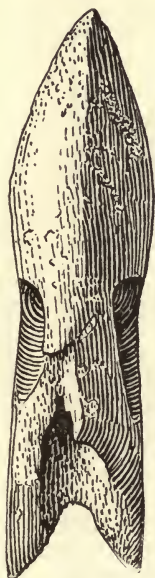


Fig. 42.

SMALL TOGGLE HEAD.

West Greenland.

Gift of Governor Fenckner.

Cat. No. 63946, U.S.N.M.

Barbs, two, in fish-tail pattern on the back. Socket, three-fourths inch deep; butt, whittled out with slight incurve; length, $2\frac{3}{4}$ inches. Gift of Governor Fenckner. Example 63947 (fig. 43), from the same locality, is a modern specimen of bone, on the same order, but an iron blade was inserted at the point. The line-hole cavities pierce the back, the grooves are deeper, and the butt end is scooped out. Length of 63947 is $2\frac{3}{4}$ inches; from Greenland. Gift of Governor Fenckner.

A toggle head from western Greenland (Cat. No. 63948, U.S.N.M.), in shape of a long rectangular pyramid with rectangular cones, is shown in fig. 44. Point formed by whittling down the sides. The blade slit lies in the plane of the long diagonal of the body. Line hole

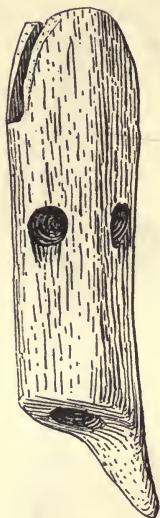


Fig. 41.

TOGGLE HEAD.

West Greenland.

Gift of Governor Fenckner.

Cat. No. 63949, U.S.N.M.



Fig. 43.

OLD TOGGLE HEAD.

West Greenland.

Gift of Governor Fenckner. Cat

No. 63947, U.S.N.M.

run in perpendicular to the two lower sides or faces, having slight line grooves. Barbs two, one on the right margin, one on the left, their tips lying in the bisecting plane of the toggle head. Socket extending into the line hole. Butt end whittled away equally above and below. Length, $2\frac{1}{4}$ inches. Gift of Governor Fenckner. Cat. No. 63950 is of the same type, $2\frac{1}{4}$ inches long.

A grave relic (Cat. No. 63950, U.S.N.M.) representing a small toggle head of a harpoon from Greenland, the gift of Governor Fenckner, is shown in fig. 45.

The body, rhomboidal in section, the back and front being about alike, is made of a segment from the columnar portion of a bone. The fact that both sides are equally hard necessitates the forming of the shaft socket in the hollow part of the bone. The barbs are cut out of the two angles or wings on the two sides of the body. The line hole is interesting, being effected by cutting two holes perpendicularly into the two faces of the belly, meeting in the hollow part of the bone. Each of these is flanked with a shallow gutter in which lies the line. The forming of a toggle head out of the middle column of a bone instead of a piece of ivory, antler, or solid bone is rare. Length, 2 inches.

An old toggle head (Cat. No. 63951, U.S.N.M.) from west Greenland is shown in fig. 46. The point has been broken off, but enough is left to show a small portion of the blade slit. It belongs to the type of specimen 45855, and the socket in the base for the foreshaft is flanked by two equal barbs. A common type in harpoon heads from this area. The line hole on the end side is formed by the meeting of

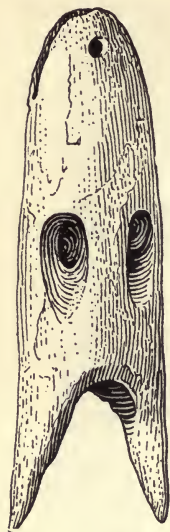


Fig. 44.

OLD TOGGLE HEAD.

West Greenland.

Gift of Governor Fenckner. Cat. No. 63948, U.S.N.M.



Fig. 46.

OLD TOGGLE HEAD.

West Greenland.

Gift of Governor Fenckner. Cat. No. 63951, U.S.N.M.

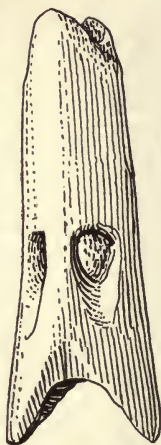


Fig. 45.

SMALL TOGGLE HEAD.

West Greenland.

Gift of Governor Fenckner. Cat. No. 63950, U.S.N.M.

two conical bores, afterwards smoothed down so as not to injure the line. This method of forming the hole by the meeting of two separate cones is well known to students of archæology. Four small perforations are seen between the line hole and the socket, drilled for the purpose of stopping the further opening of a crack in the base.

A small toggle head of bone (Cat. No. 63952, U.S.N.M.), blackened by age, from west Greenland is shown in fig. 47. It is square in cross section, one angle extending from tip of the point to tip of the barb and having a pyramidal point. There is no blade. Line holes bored straight in from the two lower surfaces, line grooves short and deep. Barb one, socket half an inch deep, butt end beveled off diagonally from lower edge to upper edge. Length, $2\frac{1}{4}$ inches. Collected by Governor Fenckner.



Fig. 47.

SMALL TOGGLE HEAD.

West Greenland.

Gift of Governor Fenckner
Cat. No. 63952, U.S.N.M.

Fig. 48.

SHAFT OF SMALLER
HARPOON.

South Greenland.

Collected by Chief Sig-
nal Officer, U. S. A.
Cat. No. 72566, U.S.N.M.

Cat. No. 63963 in the U. S. National Museum is a harpoon of bone from southwestern Greenland. It consists of two parts, the shank and the hinged toggle. The shank is pierced at one end to act as a hinge and at the other end in two places for the attachment of a shaft. The toggle is spindle shaped, hollowed on one side, and pierced with three holes to facilitate the hinging. This specimen is evidently an imitation or adaptation in bone of the iron fluke in the harpoons of the whalers. Length of shank, $4\frac{1}{2}$ inches. Gift of Governor Fenckner.

The smaller harpoon shaft (Cat. No. 72566, U.S.N.M.), from southern Greenland, is illustrated in figs. 48 and 49. This figure is introduced for the purpose of showing the details of the shaft, which are quite local. The loose shaft is made of bone or ivory, square at the base and socketed to fit over a small projection on the foreshaft. Two holes are bored through the former, and through these and two in the end of the shaft a stout rawhide thong passes and is tightly drawn to form an elastic spring, useful in the shipping and unshipping of the loose shaft. What answers to the foreshaft

in this specimen is simply a cap of ivory with a little projection on the top. The hinging line is not attached to it in any way. The ivory pegs driven into the shaft near its lower end are for the throwing stick, which is peculiar to this region, and for the eyelets used in tightening the line when the toggle is in place and ready for action.

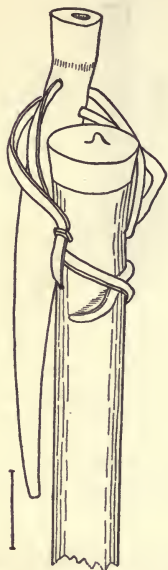


Fig. 49.

FORESHAFT AND LOOSE
SHAFT OF FIGURE 48,

consist of a peg of wood driven into a hole on one side and on the other a flat portion of bone set in a quadrangular mortise, and having at the outer end on one side a groove for the finger.

The piece of bone corresponding to the foreshaft is not more than half an inch in length, perfectly flat across the outer end, and at its middle portion is a slight projection or pivot. The loose shaft is of narwhal tusk, flattened in cross section and mortised into a piece of bone in form of a truncated cone. Its widest portion, with a slight socket in the middle, sits flat upon the cap or foreshaft. This particular combination is of a more advanced type than the ordinary ball-and-socket joint with the Cumberland Sound Eskimo, growing out of the fact that these Greenland Eskimo have been for many centuries in contact with the Scandinavians. In this case the two flattened surfaces cause the lashing to act as a spring holding the foreshaft or blade piece straight in front

Especial attention is drawn to the lower end of the shaft, on which are pegged or riveted two plates of ivory, which not only resemble feathers on an arrow, but must perform a similar function. The foreshaft is so light that it could be of little use in giving directness to the flight of the weapon, but the feathers of ivory fastened on at the end would remedy this defect and steady the shaft in the air. It is thought by some that the existence of these plates of ivory on the base of the shaft is an indication of the descent of the harpoon from the arrow.

A kaiak lance (Cat. No. 74126, U.S.N.M.) from Holstenberg, Greenland, was collected by Capt. J. W. Collins. The shaft is of pine wood, elliptical in section, tapering in both directions from the hand rest and at the front, and swells out to fit neatly the foreshaft or cap of bone. Upon the narrow side of the shaft in front of the middle portion are the finger rests, which

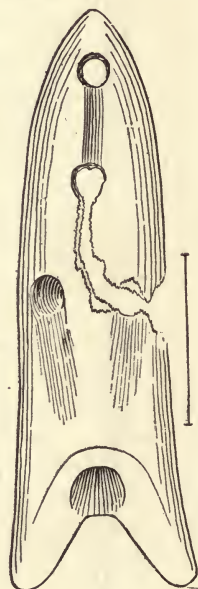


Fig. 50.

OLD TOGGLE HEAD.
Upernavik, Greenland.
Collected by Theodore Holm.
Cat. No. 130371, U.S.N.M.

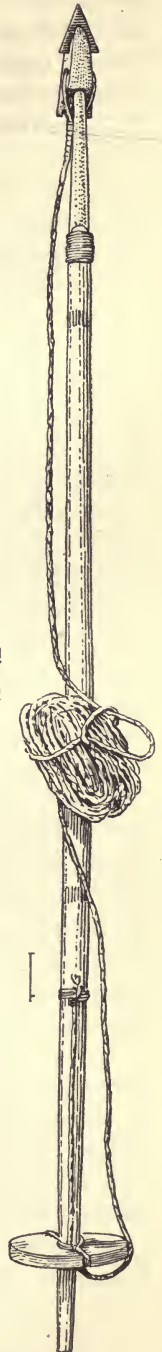
of the shaft. These two parts are united by means of a bit of rawhide passing through two holes in the foreshaft and three holes in the loose shaft a foot from the end. The lashing is similar to that of the Cumberland Sound types, with slight local differences of administration. In front of the blade piece is the blade of iron, lanceolate in form, with truncated base set in a saw cut at the tip and held fast by a copper rivet. This lance is for stabbing the walrus or whale at close quarters from the *kaiak*. Length of shaft, 62 inches; loose shaft, $8\frac{1}{2}$ inches; blade, $3\frac{1}{2}$ inches.

An old toggle harpoon head (Cat. No. 130371, U.S.N.M.) from Upernavik, Greenland, is shown in fig. 50. It has an iron blade riveted on to the front of the body, parallel to its broadest diameter. The line holes were bored in from two directions, and apparently perforated the body after the manner of the toggle head used on the Amur River and figured in Schrenck. Length of body, $3\frac{3}{8}$ inches. Gift of Theodore Holm.

A harpoon for killing whales (Cat. No. 90103), used by the Little Whale River Indians on the coast of Labrador, is shown in fig. 51. The shaft is of wood, the foreshaft of bone. The base of it is wedge-shaped, and fits into the slit at the end of the shaft, being held in place by a lashing of sinew cord. On the end of the foreshaft fits the toggle head, with iron blade held fast by two rivets. The body of the toggle head is rectangular in cross section. The line hole passes through the sides and is not seen on the lower part. The wide barbed end is cut into three or four tooth-shaped parts. The line is of rawhide, plaited. The peculiarity of this harpoon is a board, somewhat circular in form, on the lower end of the shaft, which acts as a drag to the wounded animal, in place of a seal-skin float. The line passes between this board and the shaft, and has a handle or toggle fastened at the other end to be held in the hand of the fisherman.¹

If Hearne be correct, the Eskimo west of

Fig. 51.
MODEL OF HARPOON,
Whale River, Canada.
Collected by Lucien Turner, after Murdoch. Cat. No. 90103, U.S.N.M.



¹ Lucien Turner, *Hudson Bay Eskimo*, 1894, p. 314, figs. 138, 139.

Hudson Bay have no other method of catching fish, unless it be by spears and darts; for no appearance of nets was discovered either at their tents or on any part of the shore. This is the case with all the Eskimo on the west side of Hudson Bay; spearing in summer and angling in winter are the only methods they have yet devised to catch fish, though at times their whole dependence for support is on that article.¹

HARPOONS OF THE CENTRAL ESKIMO.

Coming to the central Eskimo, Boas says of them that they inhabit the northeastern part of the continent and the eastern islands of the Arctic-American archipelago. In Smith Sound they inhabit the most northern countries visited by man, and their remains are often found at its northern outlet. The southern and western boundaries are the countries about Fort Churchill, the middle part of Back River, and the coast west of Adelaide Peninsula.² In this monograph will be found an excellent bibliography of that area, which has been famous in historic times for the efforts made there to find the northwest passage between the two great oceans.

The harpoon or principal lance (unahk, Kane) of the Eskimo is attached to the sealing line. The rod or staff is divided at right angles in two pieces, which are neatly jointed or hinged with tendon strips, but so braced by the manner in which the tendon is made to cross and bind in the lashing that, except when the two parts are severed by lateral pressure, they form but a single shaft. The point, generally an arrow-head of bone, has a socket to receive the end of the shaft; it disengages itself readily from its place, but still remains fast to the line. Thus when the kaiaker has struck his prey, the shaft escapes the risk of breaking from a pull against the grain by bending at the joint, and the point is carried free by the animal as he dives. At the right center of gravity of the harpoon, that point at which a cudgel player would grasp his staff, a neatly arranged cestus or holder (noon-sok) fits itself on the shaft. It serves to give the kaiaker a good grip when casting his weapon, but slides off from it and is left in the hand at the moment of drawing back his arm.³

In the weapons used for killing their game there is considerable variety, according to the animal they are pursuing. The most simple of these weapons is the "oonak" (Parry), which they use only for killing the small seal. It consists of a light staff of wood 4 feet in length, having at one end the point of a narwhal's horn, from 8 to 10 inches long, firmly secured by rivets and woodings; at the other end is a smaller and less effective point of the same kind. To prevent losing the ivory part, in case of the wood breaking, a stout thong

¹ Hearne, *Journey, etc.*, London, 1795, p. 159.

² Franz Boas, *The Central Eskimo*, 1888, p. 414.

³ E. K. Kane, *The Grinnell Expedition*, New York, 1854, pp. 478 and 479.

runs along the whole length of the wood, each end passing through a hole in the ivory, and the bight secured in several places to the staff.

A considerable degree of ingenuity is displayed in an appendage called "siatko," consisting of a piece of bone 3 inches long, having a point of iron at one end and at the other a small hole or socket to receive the point of the óonak. Through the middle of this instrument is secured the allek, or line of thong, of which every man has, when sealing, a couple of coils, each from 4 to 6 fathoms long, hanging at his back. These are made of the skin of the oguke, as in Greenland, and are admirably adapted to the purpose, both on account of strength and the property which they possess of preserving their pliability even in the most intense frost.¹

Formerly the harpoon (unang, Boas) consisted of a shaft having at one end an ivory point firmly attached by thongs and rivets, the point tapering toward the end. The point was slanting on one side, so as to form almost an oblique cone. Thus it facilitated the separation of the harpoon head from the unang. On the opposite end of the shaft another piece of ivory was attached, generally forming a knob. The material used in making the shaft was wood, bone, or ivory, according to the region in which it was manufactured. In Iglulik and in Aggo the narwhal's horn was the favorite material for the whole implement, a single horn being sufficient to make a whole shaft. Wherever wood could be procured small pieces were ingeniously lashed together. As the shaft is apt to be broken by the struggles of the animal when struck by the weapon, it was strengthened by a stout thong running along the whole length of the shaft.²

A strange method of hunting is reported by Ross² as practiced by the Netchillirmiut. Eight men slowly approached the basking seal until it raised its head, when those in front stopped and shouted as loud as they could, on which three others ran up with incredible swiftness, and the leader struck it with the spear.³

Boas says that when the smaller bays are sufficiently frozen to permit, the hunters will visit the edge of the newly formed floe in order to shoot the seals, which are afterwards secured by the retrieving harpoon.⁴

A fine old toggle head (Cat. No. 8278) from Smith Sound, was collected by Dr. I. I. Hayes. The body is of ivory, thin, spatulate in form, and lenticular in cross section. The blade of iron is almost concealed in a deep saw cut and fastened with an iron rivet. The line hole has been bored out with a drill that was too small and enlarged by cutting. One side of the body having split off, and the other side cracked, the

¹ Parry, Second Voyage, London, 1824, p. 507.

² Narrative, etc., London, 1835, II, p. 451.

³ Sixth Annual Report of the Bureau of Ethnology, p. 485.

⁴ Compare Murdoch's account of the retrieving harpoon, Sixth Annual Report of the Bureau of Ethnology, p. 420.

Eskimo has ingeniously drilled a series of holes along the margins and repaired the socket by means of sealskin thongs rolled backward and forward. The line in this case is a coarse thong of walrus hide, which is looped through the line hole and fastened by a wrapping with a smaller thong, in which the Eskimo has exhausted his ingenuity by a variety of knots and splices.



Fig. 52.

OLD BARBED AND TOGGLE HEAD.

Upernavik, Greenland.

Collected by I. I. Hayes.
Cat. No. 8279, U.S.N.M.

seen above it. The precise use of these perforations is not known. Socket an inch deep, the butt end whittled off with a slight incurve. Length, 6 inches; diameter, three-fourths inch. Collected by Dr. I. I. Hayes.

A loose head of a lance (Cat. No. 10136, U.S.N.M.) is given in fig. 53. A careful inspection of this specimen, and others like it, will show that it lacks the essential qualities of a harpoon, namely, of being hinged to the end of the shaft and of retrieving. There is neither barb nor toggle on this specimen or

others of the same class. The hinged lance, either in the form of a weapon to be thrust or of one to be thrown from hand or bow or throwing stick, is exceedingly rare. Only in the areas where immense sea mammals are hunted is it thought necessary to guard in this way

A combined barbed and toggle harpoon head of bone (Cat. No. 8279 U.S.N.M.) from Upernavik, Greenland, is shown in fig. 52. Body long, irregular cylinder, whose diameter varies in proportion to the strain at each point, cut off quite abruptly at the point. The economy of material is noteworthy. Blade cut shallow; iron blade broken off, but its lower margin remains in the cut, held in place by means of an iron rivet. Line hole small, curved up and strengthened on the outside by an additional thickness of the body. Line grooves slight. Barbs, two, the front one a very prominent hook, triangular underneath, its rear margin also a shallow hook with rounded edge. In this respect the specimen is unique in the U. S. National Museum. The rear barb is cocked up and pointed. In the tip of this barb is a hole half an inch deep, and three small perforations for rivets are to be

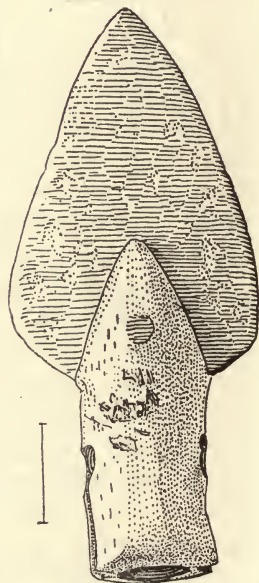
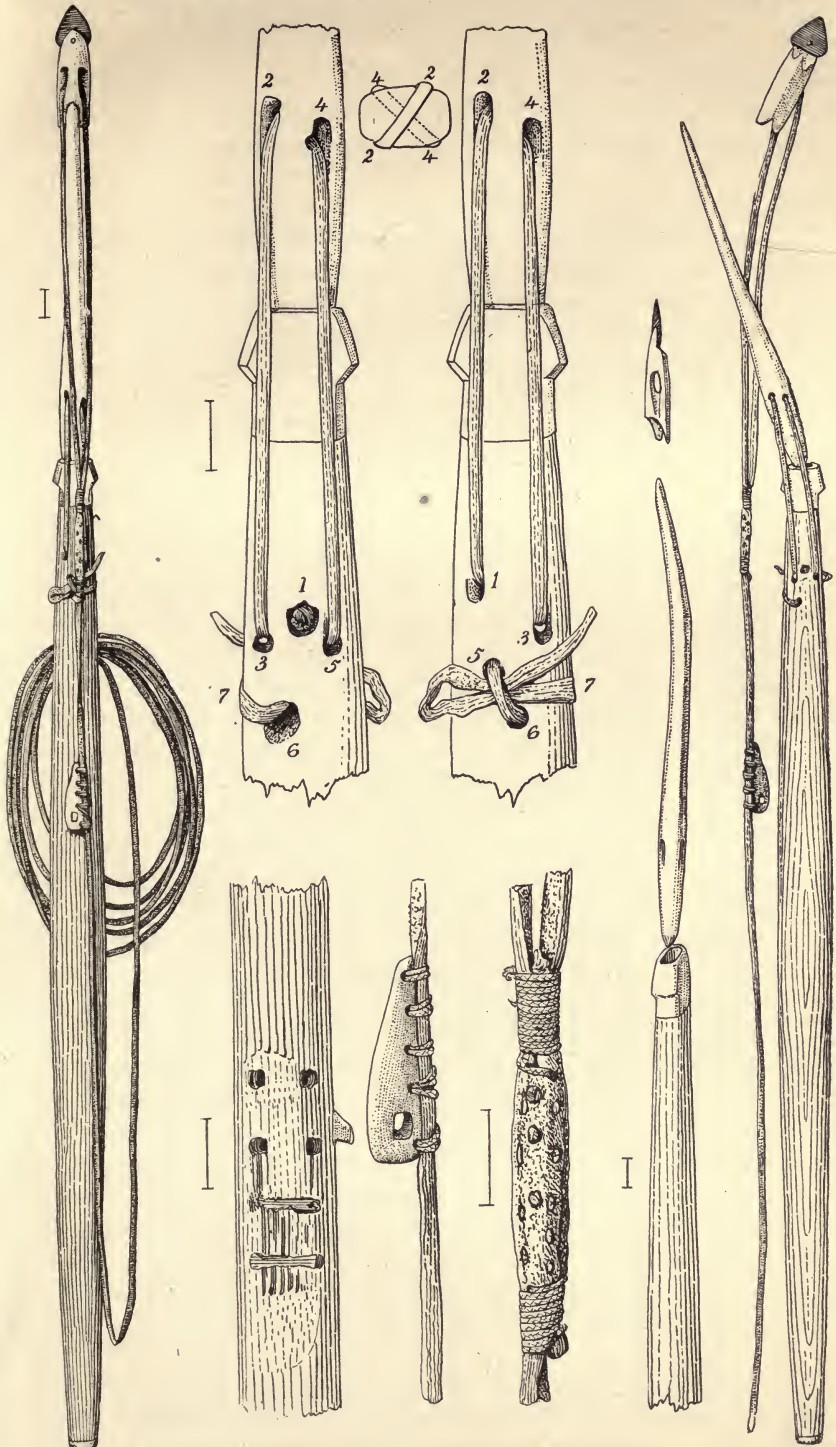


Fig. 53.

LOOSE HEAD OF A LANCE.

Repulse Bay.

Collected by C. F. Hall. Cat. No.
10136, U.S.N.M.



COMPLETE SEAL HARPOON, CUMBERLAND SOUND.

Collected by George Y. Nickerson.

Cat. No. 19519, U.S.N.M.

against breaking the shaft. Indeed, it will be found that the Eskimo on the other side of the continent do not hinge the lance head, but merely socket it and leave it in the animal stabbed. Collected by Captain C. F. Hall.

An old, much weather-beaten toggle head of bone (Cat. No. 10404, U.S.N.M.), without blade, from Repulse Bay, is shown in fig. 54. The body is perfectly flat on the back and uniformly ridged below, so that in section the form is that of a hat with narrow rim. The blade slit in the truncated tip shallow and wide and there is no show of rivets. Linehole, large and straight through, with wide grooves before and behind it. There were evidently two barbs, but after some mending one has disappeared. The butt was beveled nearly in a plane surface. Sockets half an inch deep. Length, $3\frac{1}{4}$ inches. Collected by Captain C. F. Hall.

Example 19519, in the U. S. National Museum, Plate 6, is a complete toggle harpoon for seals, from Cumberland Sound region, collected by George Y. Nickerson. The shaft (qijuqtenga) is of hard pine wood, quadrangular in section, with rounded corners, thick in the middle, and tapering toward either end. The foreshaft (qatirn) or socket piece, about 2 inches long, is of walrus ivory, mortised neatly upon a tenon at the end of the shaft. In longitudinal section it is in the shape of a tanged lance blade, with the point truncated. The upper and outer end of the qatirn has a rounded socket for the reception of the loose shaft, to be described. At the lower end of the shaft is an ivory cap, set on and held in place by two wooden dowels. Upon the narrow margin of the shaft, absent in this specimen, is set a hand rest (tikagung), as a stop for the hand of the hunter when making his thrust. At right angles to the tikagung is a peg or button of ivory, which fits into the telliqbing or eyelet piece of ivory on the line. The loose shaft is a stout piece of ivory, spindle shaped, with a long taper in front and a very short tapering butt end. This fits like a ball at the socket joint into the socket.

At the end of the qatirn or foreshaft two holes are bored through the loose shaft 3 inches from the socket joint. Corresponding holes are bored through the shaft 4 inches from the front end. An inch farther back from these two holes two other holes are bored near together.

Looking at this apparatus from one side, a seal-skin thong passes from the back forward through the upper left-hand hole in the shaft, up through the left-hand hole in the loose shaft, back and through the upper right-hand hole in the shaft, and up and through the right-hand

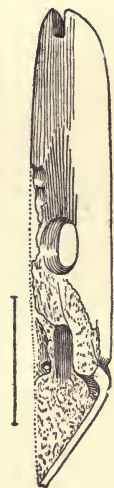


Fig. 54.

TOGGLE HEAD.

Repulse Bay.

Collected by C. F. Hall.
Cat. No. 10404, U.S.N.M.

hole in the loose shaft, and down to the lower right-hand hole in the shaft, through and back through the lower left-hand hole in the shaft, half way round the shaft, and gathered in a loose knot through the lower bend of the thong on the front side of the shaft. This ingenious joint deserves especial attention. It is put in place while wet or green, and by its shrinking forms a close hinge for holding the loose shaft in the socket of the foreshaft. When a large animal is struck and the loose shaft rammed into its body, the violent motion, instead of breaking the brittle ivory, unbends the ball and socket joint, the thong serving as a hinge.

The toggle head (tokang) is of walrus ivory, flat on one side and obtusely angular on the other. On this same side are two large angular cuts, forming a perforation entirely through but not piercing the back. Barbs, two.

The line (alirn) is of stout rawhide bent through the hole in the toggle head, and the end is joined to the standing part by being sewed together, and also seized or wrapped at either end of this sewing. On the alirn, at a point exactly corresponding to the hand rest, is sewed or run the teliqing, which is a somewhat flat piece of ivory, having five holes for the stitching or braid of sinew and a quadrangular hole cut in the broad part to fit over the ivory peg on the side of the shaft, which draws the line perfectly tight and holds the toggle head on the tip end of the loose shaft. The line may be continued to any length, where it terminates in a loop, and one or more bladders (avatang) may be attached to it. Length of shaft, 41 inches; loose shaft, 16 inches; tokang, 5 inches.

The head (Cat. No. 25654, U.S.N.M.) of a whale harpoon from Hudson Bay is shown in fig. 55. It is made of walrus ivory, and probably by machinery. The U. S. National Museum possesses a large number of harpoon heads of this type. The angle on the back is sharp and the front is hexagonal. The specimen conforms to a model or type as if made in large numbers for trade with the Eskimo.

The blade is of iron and neatly fitted into a socket in the bluntly pointed tip end of the body. At the upper inner corner of the blade is a perforation for the reception of a small line of sinew, which serves to retain the blade if it becomes detached from its slit. The socket is a shallow conical cavity, made to fit on the outer end of the loose shaft. The butt end is a long bevel, slightly incurved. The line hole is made with great care, being a large triangular opening with ample grooves on either side for the play of the line. The material is

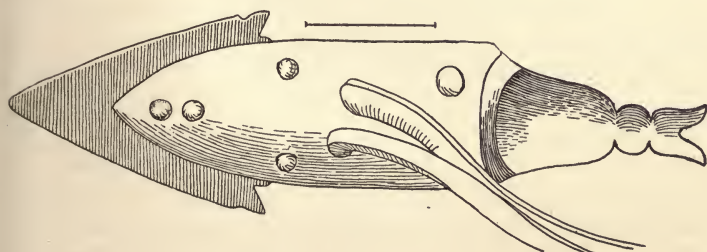
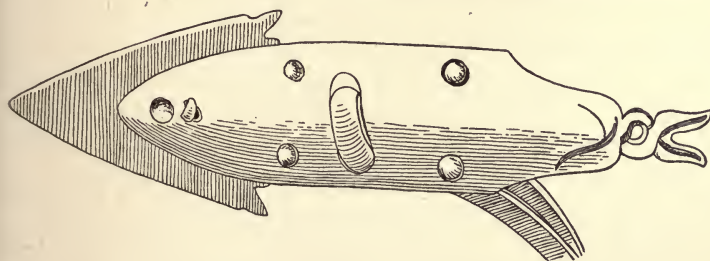
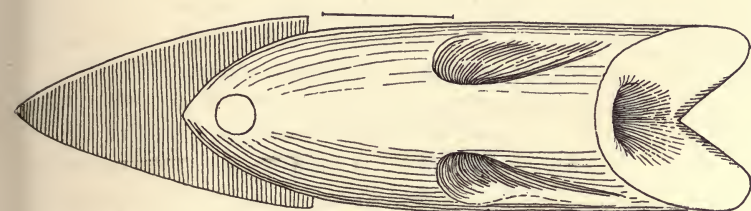
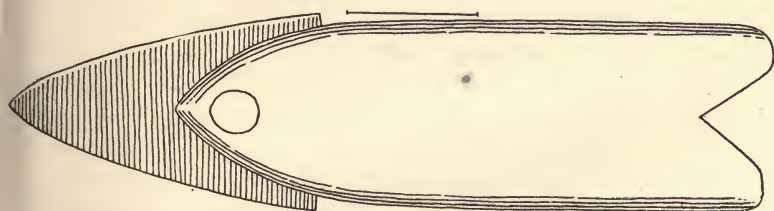
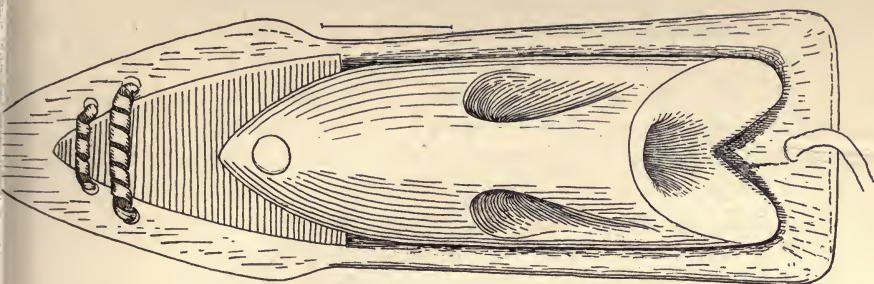


Fig. 55.

HEAD OF WHALE
HARPOON.

Hudson Bay.

Collected by J. H.
Bartlett. Cat. No.
25654, U.S.N.M.



TOGGLE HARPOON HEADS, AMUR RIVER AND CUMBERLAND SOUND.

Amur example, after Von Schrenk; Cumberland Gulf example, Cat. No. 34064, U.S.N.M.

Collected by Ludwig Kumlein.

cut away economically at every point, so as to protect the line from abrasion. There is no separate becket, but the end of the line is spliced into itself to form a loop.

No. 25554 is similar to the foregoing in most respects. The outline is a little more artistic, but the general form and functioning of the parts are precisely the same. Length of blade, $2\frac{1}{2}$ inches; length of body, 6 inches.

Plate 7 is a typical broad toggle harpoon head (Cat. No. 34064, U.S.N.M.) from Cumberland Sound. The ivory body is lingulate in outline, nearly flat on the back, and rounded beneath for line hole and socket. Blade triangular, oblong, set 1 inch into the saw cut, and held in place by a large copper rivet. No blade hole is present. Line hole well back, large, bent up a little, and running into very deep line grooves. Socket wide and shallow. Barbs, two, formed by the bifurcation of the back. Butt end curved in and somewhat gouged out. Length, $5\frac{1}{2}$ inches. Collected by Ludwig Kumlein. The head fits back downward into a cover carved of a piece of pine wood. The point lies under two loops of baleen passed through the wood and frapped. A rawhide thong fastened into the butt serves to wrap the toggle and cover together. Other specimens in the Museum, collected in the same locality by Mr. Kumlein, have precisely the same characteristics. The specimens are more slender. It will be noted that the blade, the barbs, or spurs at the base, and the bottom or inside of the line hole are in parallel planes. This is to be regarded as the old or primitive style. In the more modern heads, as will be seen, the line hole is perpendicular to the plane of the blade. Front and side views of a large toggle head from the Amur are given to show how the old type survives in out-of-the-way places far apart, while the new type holds the intermediate localities. (Schrenck, Plate 42.)

The head of a whale lance (Cat. No. 34067, U.S.N.M.) from Cumberland Gulf, collected by Ludwig Kumlein, is shown in fig. 56. The body is of ivory, in the form of a flattened conoid. The blade of iron is leaf-shaped, set into a saw cut at the point in the plane of the widest diameter of the head, and held in place by a brass rivet. The shaft socket is a deep cone. On either side of the head a line hole is made by two borings, one vertical and the other horizontal and larger. Into each a line or thong of seal hide is drawn, with a knot on the upper

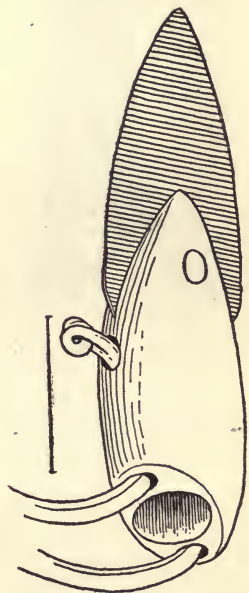


Fig. 56.

HEAD OF WHALE LANCE.

Cumberland Sound.

Collected by L. Kumlein. Cat. No.
34067, U.S.N.M.

end which fits into the horizontal bore and forms a button or stop. These two thongs unite about a foot below the head to form one continuous line. Length of head, $3\frac{3}{8}$ inches.



Fig. 57.

TOGGLE HEAD, TAKEN FROM
DEAD WHALE.

Cumberland Sound.

Collected by Ludwig Kumlein,
after Franz Boas. Cat. No. 34069.
U.S.N.M.

barbs, and these are split at their hinder extremity. The tips of the barbs have ornamental notches. The socket below the plane of the barbs is wide and shallow. Mr. Kumlein believes that this head was thrust into the whale while it was a yearling, as the Eskimo do not attack a large one with their own weapons. Length, 4 inches.¹

A loose head of a seal lance (Cat. No. 34068, U.S.N.M.) is shown in fig. 58. Body is of ivory, blade pentagonal in shape, and fastened in with a rivet. The body is conoid in form, with a square base. The socket for the end of the foreshaft is conical, and alongside of this at the margin two holes are bored, opposite each other, perpendicular for a notch, at which point they are met by two other

A broad, flat harpoon head (Cat. No. 34069, U.S.N.M.) of walrus ivory (tokang), taken from a large *Balæna mysticetus* caught in Cumberland Sound in 1878, is shown in fig. 57. This specimen was collected by Ludwig Kumlein. The body is lingulate in form, with a sharper curve below. The iron blade, broken off at the point, is deep, set into a saw cut, and riveted with iron. Near the left-hand corner is bored a blade hole for a securing line. The line hole is large, curved upward, and the grooves are deep for the thick rawhide line, but they do not perforate the head and they are not seen on the back of the toggle head. The butt end is gouged out in a spoon-shaped cavity and is bifurcated to form two

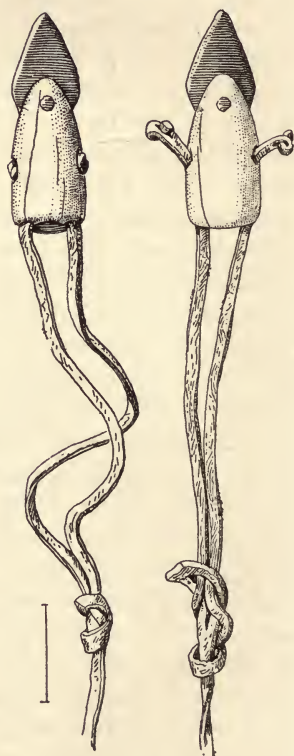


Fig. 58.

LOOSE HEAD OF LANCE.

Cumberland Sound.

Collected by Ludwig Kumlein. Cat. No.
34068, U.S.N.M.

¹Sixth Annual Report of the Bureau of Ethnology, p. 490, fig. 422.

holes bored in horizontally. Into these holes fit two rawhide thongs, by means of which the loose heads are attached firmly to the end of the shaft. The noticeable feature about this specimen is the thoroughly aboriginal style of boring the holes and of attaching the thongs. The slit is cut near the end of the thong, and through this the outer end passes, being bent backward. This forms a button which fits exactly into the horizontal hole on the side of the head. At the other end of the thongs in the drawing are shown methods of splicing practiced by the central Eskimo. There is nothing which exhibits their ingenuity more effectively than the way in which the difficulties are overcome by simple processes.

A lance head (Cat. No. 34076, U.S.N.M.) from Cumberland Sound is shown in fig. 60. It can not be called either a toggle head or a barb, since it possesses neither characteristic. It is simply a pivoted lance head. Body, flat. Blade, of iron, irregularly rhomboidal, made to fit into the saw cut by a nail head driven under the edge, held in place by an iron rivet.

There is no line hole in the harpoon acceptance, but on either side of the socket a hole is bored forward in the plane of the blade and met by a larger one bored inward half an inch from the butt end. Into each hole a rawhide line is made fast by means of a knot peculiar to the Eskimo, effected by cutting a slit a short distance from the end of the line and tucking the end backward through the slit. This knot will enter the larger hole on the side, but will not pull through the smaller longitudinal one. The socket is conical, wide, and fully an inch deep. Length, 2 inches. Collected in Cumberland Sound by Ludwig Kumlein. Similar to this are 34068 and 34077 (fig. 59), and Boas figures another specimen after Kumlein's drawings.

Cat. No. 73529 in the U. S. National Museum is a whale lance (anguvigang), from Cumberland Sound. The shaft (qijuqtenga) is of hard pine wood, possibly from a ship. Cross section elliptical and flattened. It is tapering in the middle in both directions. The fore-



Fig. 60.

LOOSE HEAD OF LANCE.
Cumberland Sound.
Collected by Ludwig
Kumlein. Cat. No. 34076,
U.S.N.M.

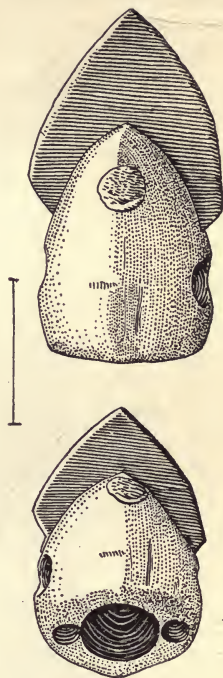


Fig. 59.

LOOSE HEAD OF LANCE.
Cumberland Sound.
Collected by Ludwig Kumlein
Cat. No. 34077, U.S.N.M.

shaft (qatirn) is a short head of bone mortised upon the end of the shaft, truncated arrow shaped, in longitudinal cross section. On the narrow side of the shaft, about one-third of the distance from the foreshaft, is a hand rest (tikagung) made of a quadrangular bit of bone. This is perforated from side to side, laid against the shaft and lashed with a

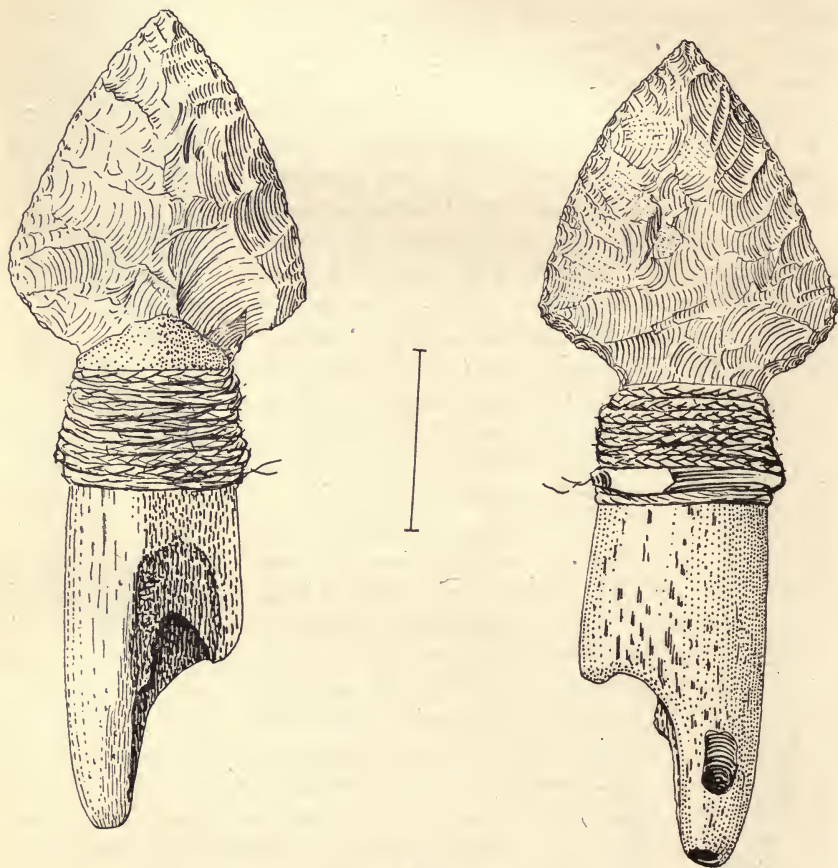


Fig. 61.

OLD TOGGLE HEAD WITH STONE BLADE.

Cumberland Sound.

Collected by Geo. Y. Nickerson. Cat. No. 19521, U.S.N.M.

strip of baleen. At right angles to this on the broad side of the shaft is a peg protruding, resembling the peg for the line, but it is evidently an added part, as it has no function.

The loose shaft of ivory has a blunt pivot on the inner end which fits into a socket in the foreshaft to form the ball-and-socket joint (lgaming). The head is irregular, hexagonal in cross section and in a saw cut in the front end a leaf-shaped blade of iron is inserted and riveted. The loose shaft and the foreshaft are hinged together, as in other speci-

mens, by a thong of rawhide. This ingenious joint is most effective as a universal hinge. It can be easily unloosed and made tighter. By a universal hinge it is meant that in every direction the loose shaft is sustained in a line with the shaft by the rigidity of the rawhide, which is not so strong, however, but that when an extraordinary strain is placed upon the loose shaft the rawhide will give way in any direction and allow the pivot to come out of the socket and save the apparatus from breakage. No long line is used with this form of apparatus. A similar specimen is figured from the Berlin Ethnological Museum, by Dr. Franz Boas.¹ Length of shaft, 43 inches; loose shaft, 16 inches.

The harpoon of the Cumberland area, as shown by the previous descriptions and illustrations, is far more primitive and less affected by contact with Europe than that of Greenland or Hudson Bay type. In closing a study of this region attention is called to fig. 61, Catalogue No. 19521 in the U. S. National Museum. It can not certainly be defined as a barbed head, nor as a toggle head. It has the form of the toggle head, but the line hole, instead of passing through the body above the socket, is a perforation in the end of the spur. A hole has been bored through this end in a line parallel to the axis of the body and is met by another perforation on the side of the spur. The connecting line evidently passed up through this opening and was toggled by means of an Eskimo knot formed by cutting a slot near the end of the thong and turning the end back through the slit. The socket does not differ from that of other harpoons. The head, however, is a large and lanceolate blade of chipped stone, reminding one of the whale lance blades brought home by Ray from Point Barrow and described by Murdoch. The tang of this blade fits upon an offset at the end of the body and is held in place by a knot, also of sinew braid. The perforation in the spur for the connecting line is almost unique in the collections of the U. S. National Museum. One other specimen has a perforation at this point, fig. 52, Catalogue No. 8279. In this specimen, however, the perforation seems to have no function, since through the body of the toggle head there is a regular line hole with line grooves.

HARPOONS OF ARCTIC ALASKA.

The situation, the climate, the people, and the natural resources of this area are minutely set forth by Murdoch. The harpoon, as will be seen, is related to all these. In his treatise on Point Barrow Eskimo the last-named writer describes and figures both seal darts and toggle harpoons, and these are included in our subject. He says that the Eskimo use, to capture the smaller marine animals, a dart or small harpoon having a loose barbed head of bone fitted into a socket at the end of the shaft, to which it is attached by a line of greater or less

¹Sixth Annual Report of the Bureau of Ethnology, p. 496, fig. 432.

length. It is always contrived so that when the head is struck into the animal the shaft is detached and acts as a drag. At Point Barrow only the small form of dart is used. In ancient times a larger weapon, with bladder on the side of the shaft, was employed. All kinds of marine animals are also pursued with toggle harpoons of the same general type, but of different patterns for different animals. They are divided into two classes, those intended for throwing and those which are thrust with the hand. Both classes agree in having only the head attached permanently to the line fitted loosely to the end of the shaft, and arranged so that when struck into the animal it is detached from the shaft and turns under the skin at right angles to the line. The harpoons of this arctic Alaskan area are then explained and figured in great detail by Murdoch.¹

The same writer says that before the introduction of iron it was discovered that when the blade of the toggle harpoon is inserted parallel to the line hole the toggle head is less liable to pull out. At any rate, by a kind of necessity, the blade part of the oldest forms is transverse to the line hole. Also, by the exigencies of the broad body of bone and ivory, the blade of the Amur and eastern Eskimo regions is inserted parallel to the line hole.

Late in the autumn, when the pack is driven toward the land by the north wind, the ice forms rapidly. The hunters travel over it, as soon as it will bear their weight, to look for the "alloos," or breathing places, formed in the new ice when quite thin; this is gently raised by the animal's head into a slight mound, and a small hole opened with its nose and breath. These spots would escape notice were it not for the congealing of the breath forming a little hummock of hoar frost on the surface. It is this which reveals to the hunter an "alloo," or breathing place of a seal. Every seal has not its own breathing places, but more probably the instinct of the animal causes it to form many when the ice is thin, and many are frozen up for want of attention. Later in the season, as the ice grows thicker, it floats higher, leaving a larger and longer air space beneath, as the seal, when it visits the "alloo," scratches away the ice on the under side.

By these places the hunter takes his position, and, for fear the seal will catch the scent of his person, he carries a small three-legged stool on which he squats, taking his position on the lee side of the seal hole, watching and listening for the game. Of course he can not see the seal, but if there is a little wind he can see the vapor of its breath and hear the slight ripple in the water caused by the act of breathing.

When the hunter discovers the presence of the seal, his spear is sent crashing through the thin dome of ice into the animal, and so small

¹ Point Barrow Expedition, 1892, pp. 218-240.

are the quarters that the seal is seldom missed. The ice is then broken away and the hole enlarged until the game can be removed, this work being done with the ever-present ice pick.

The implements used in this method of hunting seal are a harpoon, to the staff of which is attached an ice pick, a line, and a stool to stand on. The stool serves the purpose of keeping the feet of the hunter dry, for newly formed ice is always very damp, and the long, patient waiting by the alloos would wet the feet of the hunter, after which he could not remain because of the intense cold, for furs are little protection if wet. At this season open water is formed by the current moving the ice, which presses together, leaving small spaces of open water. Seal passing these spaces will often come to the surface to breathe, and at such times fall an easy prey to the hunter's rifle and retrieving harpoon.

I am indebted for the information given above to Captain Herendeen, who lived many years at Point Barrow. He also says that whale fishing is carried on in the months of April and May.

On arriving home from the great spring reindeer hunt, about the 1st of April, the Eskimo have a few days of feasting and consultation. The wooden dishes of steaming venison are carried to the council house, "Cuddigon Igloo," where the men are gathered to talk over the coming whale hunt, and the sages tell of the conditions of ice required to make a favorable and successful season.

The wooden part of everything that is put into the umiak or freight boat is whittled or scraped off clean and smooth, so that the wood looks bright and new.

The women prepare the sealskin floats or pokes, as they are called by the American whalers, as follows: A seal is captured and the skin cut around the head near the eyes. When the skin is cut free from the blubber and turned back, and the flippers are reached, they are unjointed near the body of the seal and the process continued until the carcass is removed. The blubber is scraped clean from the flesh side of the skin, and the bones carefully removed from the flippers. This is a delicate piece of work, for to cut the skin would ruin it for a float. After this is accomplished all natural vents to the body are closed by tying them around an ivory stud made for the purpose. Through one of these a hole is drilled to inflate the poke. The neck is passed over a stick about 6 inches long by 1 inch in diameter, then sewed up and the stick brought up to the seam and very firmly lashed with braided sinew. The poke is now blown up and stretched as much as possible by rolling and standing on it. Again it is scraped to remove the oil, and hung up in its inflated state to dry. After a few days it is oiled with the oil from the stone lamp. This dries more quickly than raw oil, and when dried again a coating is formed which is quite impervious to water. The lashing is now removed from the

neck, the skin carefully turned hair side out, a permanent lashing put on the neck and stick, when the poke is blown up again and is ready for use.

The harpoon line is made of walrus hide, very strong and often double. Its end is made fast around the lashing between the stick and the poke. Two pokes are used on the harpoon line, which terminates in a bridle. Still another poke is used as a trailer, the harpoon line being not more than 5 fathoms in length. The third poke or trailer has a small line 15 or 20 fathoms long. This trailer keeps on the surface and tells the hunters the position of the whale, thus making the pursuit much easier.

The harpoons used are to be found in the U. S. National Museum collection. The staff is about 10 feet long, tapering at each end. It is never thrown, but thrust into the whale, and great force is needed to drive this rather bulky instrument through the tough fibrous blubber when the cutting portion is formed of stone, as was always the case before the advent of the white man. These people are so governed by superstitions that they fear dire disaster would overtake them if they did not use the stone cutting points of their fathers on the first whale; after that they can use what seems best for the occasion.

The other implements to complete the outfit of an umiak are as follows: Three pokes well inflated and ready for use, and from three to five more all ready to be blown up; a paddle for each person, the one used for steering being much larger than the others; an implement for bailing the umiak, made of the reindeer antler, as it is very desirable to remove the water as soon as possible after it leaks in; a long knife, fixed on a pole 10 feet in length, for cutting blubber and lean meat under water; three gaffs (hooks on poles) of different lengths, varying from 6 to 12 feet, the hooks of ivory; these are useful to hook on to the portion of flesh to be cut off; a little bag with plugs whittled out to put in the mouthpiece used to inflate the pokes; these plugs are often broken, and an extra one must be kept on hand; a large wooden scoop to bail when a quantity of water gets into the umiak; a spare whale harpoon; a crutch to lash in the prow of the umiak to rest the harpoon on; the two tips of this rest are carved in a rude semblance to a whale's head; the skin of a crow, some eagle feathers, and a little earth in a small bag from the grave of some noted whale hunter, for good luck; some of these crow skins have been used many years and are in a most dilapidated condition, but are highly esteemed, for they have been present at the death of many a whale; great wisdom is accredited to the eagle and the crow, and it is considered quite the proper thing to use this talisman in order to overcome the cunning of the whale; a couple of toggles made of ivory, in the shape of a whale; and straps to lash the pectoral fins of the whale when towing, so the fins will not drag heavily through the water; a bag of provi-

sions. The men of the boat's crew carry their guns to shoot passing seals during the weary wait for the whale to come. Two women will be found in most crews. Each woman carries a sealskin bag to thaw out the snow for drinking purposes; the snow is put in the bag and its mouth firmly tied; it is then placed on her back between the inner and outer coat. The women also have their sewing outfits, to mend any breaks in the umiak.

In hunting through the ice the Eskimo of Point Barrow used a different shaped harpoon, with a long ivory piece on each end and a smaller head. As the seal comes up to blow they hurl this spear through the hole; then they drown the seal. After the animal is dead they haul it through the ice, picking the ice away until the hole is large enough to get the seal out. The animals do not freeze quickly, because they have such a coating of blubber. (Mr. Charles Browsers.)

A combined barbed and toggle harpoon head (Cat. No. 1328, U.S.N.M.) of antler, from the Mackenzie River district, is shown in fig. 62. Body sagittate, tapering to a flat angular tip. Blade of iron, with a long rectangular tang and a triangular point with slight projections at its base. The tang is snugly fitted into the slit and held by an iron rivet. There is a line hole at one angle of the point, but it may have been there previously, since these Eskimos especially work up all the old iron they get their hands on.

Line hole straight through the body behind the lateral barbs, and without slight grooves. Barbs, three; two on the sides, on an arrowhead, ornamented with longitudinal lines, and one terminating the back in a point. Socket half an inch deep. Butt end having two faces, the lower almost at right angles with the body, the upper whittled thin under the barb. Length, $3\frac{3}{4}$ inches. Collected by C. P. Gaudet. To this special type belong also many other examples. The National Museum is under infinite obligations to Messrs. Robert MacFarlane, B. R. Ross, and R. Kennicott for Mackenzie River materials.

A barbed seal harpoon (Cat. No. 16675, U.S.N.M.) for throwing stick. The shaft is of light pine wood, tapering backward, and is slightly thickened at the butt end. It is attached to the foreshaft by means of a socket and shank on the foreshaft. The foreshaft is of whale's bone, cylindrical. The tang is a plug cut on the end of the bone, fitting into the socket of the foreshaft. A hole is bored through the tang, through which the assembling line passes to hold the two parts together. The socket for the point is elliptical in section. No feathers are used. The point is of bone, delicate in form. Shank



Fig. 62.

BARBED AND TOGGLE HEAD.

Mackenzie River.

Collected by C. P.

Gaudet. Cat. No.

1328, U.S.N.M.

oval in section. Barbs, three on each margin. Line hole oblong. The line is of rawhide, one end fastened through the line hole by a triple splice. About midway the line is split and the two ends are fastened as a martingale—one around the shaft near the foreshaft, the other 18 inches from the butt end, both by a clove hitch. The assembling line on this specimen is short. It is pressed into the wood just below the juncture with the foreshaft and passes forward, then through the perforations in the foreshaft and backward, where it makes three clove hitches and then is continued backward, where the upper end of the martingale is attached, and is fastened off by a half hitch, the end being pressed into the wood. This specimen is from Kotzebue Sound, collected by W. H. Dall. Length of shaft, $49\frac{1}{4}$ inches; foreshaft, 5 inches; point $2\frac{3}{4}$ inches.



Fig. 63.

TOGGLE HEAD.
Diomedé Island,
Collected by E. W.
Nelson. Cat. No.
38775, U.S.N.M.

A large toggle head of a harpoon without blade (Cat. No. 38775, U.S.N.M.), from Diomedé Island, is shown in fig. 63. It is of a typical form. The body is high and narrow, elliptical in outline, but having flattened faces here and there. The line hole is cut straight through, and is a flat ellipse in outline, $1\frac{1}{2}$ inches long and three-eighths inch wide, with no attempt at line grooves. There is one immense barb formed by the back prolonged, ridged, and cocked up. The shallow socket is in a long cut or chamfer forming the butt end. Length, $8\frac{1}{4}$ inches. Collected by E. W. Nelson. To this same class of long, slender heads with large line hole belong the

following specimens, with polygonal cross section.

Cat. No. 48589 (fig. 64), from Kotzebue Sound, collected by Nelson, is a little model in walrus ivory of a precisely similar head, with perpendicular blade and very long bevel at the butt end.

A typical Alaskan walrus toggle head (Cat. No. 49167, U.S.N.M.), from Diomedé Island, is shown in fig. 65. The body is of walrus ivory, conoid, with sloping faces on the back. Blade of iron, large in proportion, square at the base, set $1\frac{1}{2}$ inches into the slit, and held by a bone pin.

Line hole oblong, straight through, widened behind, and flanked by two short grooves. Barb, one, angular; socket for the end of the shaft half an inch deep. Butt end cut off in a plane slightly warped at the socket. Length, 5 inches. Collected by E. W. Nelson.



Fig. 64.

MODEL OF TOGGLE
HEAD.

Kotzebue Sound.
Collected by E. W.
Nelson. Cat. No.
48589, U.S.N.M.

A toggle head of a whale harpoon (Cat. No. 56601, U.S.N.M.), from Point Barrow, Alaska, collected by Captain Ray and described by Murdoch (1892, p. 238), is shown in fig. 66. Specimens of this kind are made for the market. The blades are triangular, the corners somewhat rounded off. The body is of coarse whale's bone, from the rib or jaw. Only two out of a large number collected by Ray are of ivory.

The blade of this example is of brass, set into a saw cut in the end of the body and held in place by a bone rivet. The body is somewhat quadrangular in section, the line hole is well back from the blade, and the body widens from the front to this point. The line grooves extend outward beyond the base. The single spur is long and inclined upward. The base, contrary to

the usual pattern, is somewhat convex. In the great mass of toggle harpoons the base is either concave or formed by two planes which make a different angle with the axis of the specimen. But in this case the contrary is true. The socket for the foreshaft is wide and deep.

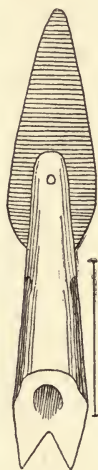


Fig. 67.

TOGGLE HEAD.
Point Barrow,
Alaska.

Collected by P. H.
Ray. Cat. No.
56614, U.S.N.M.

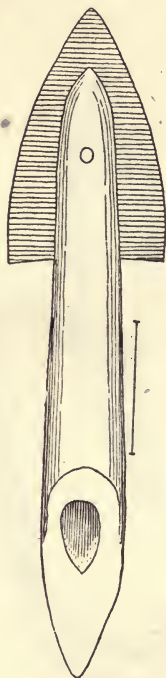


Fig. 65.

TOGGLE HEAD.

Diomed Island, Bering
Strait.

Collected by E. W. Nelson
Cat. No. 49167, U.S.N.M.



Fig. 66.

TOGGLE HEAD OF WHALE
HARPOON.

Point Barrow.

Collected by P. H. Ray.
Cat. No. 56601, U.S.N.M.

A small toggle head (Cat. No. 56614, U.S.N.M.) of bone, from Point Barrow, for catching seal, is shown in fig. 67. Body conoid, flattened laterally. Blade lanceolate, just fitting at its base into the slit of the head and fastened with an iron rivet. Line hole straight through and flanked by deep grooves. Barbs, two, formed by a file cut in the back. This is a common practice on hundreds of modern specimens. Socket for the shaft shallow and distinctly margined. Butt end formed by the meeting of two planes. Length, 3 inches. Collected by P. H. Ray.

A new style toggle head (Cat. No. 56620, U.S.N.M.) from Point Barrow, is shown in fig. 68. A large number of specimens of this type were brought home by the Ray expedition. The body is of antler and the blade is set into the saw cut at right angles to the plane of the body, barbed. The line hole is in the plane of the blade. The socket for the foreshaft divides the base into two parts with different slope, the one nearly perpendicular, the other with a slight angle, so as to form the barb. Of this specimen Murdoch says, "It is a newly made model in reindeer antler of the ancient harpoon, but evidently by a

man used to modern patterns, so that the blade is set in at the wrong angle."

Walrus harpoons (Cat. Nos. 56670 and 56672, U. S. N. M.) from Point Barrow, Alaska, collected by P. H. Ray, are shown in figs. 69 *a* and *b*. The shaft of the former is of spruce, 71 inches long, rounded, and tapering from the middle in both directions. The club-shaped foreshaft is of ivory and has a wedge-shaped tang which fits in a cleft at the end of the shaft. The shaft and foreshaft are fastened together by a whipping of seal thong put on wet, one end fastened through a hole in the shaft, and the whole kept from slipping by a ridge on each side of the tang. In the tip of the foreshaft is a deep, round socket to receive the loose shaft, a tapering rod of walrus ivory, secured by a piece of seal thong



Fig. 68.

TOGGLE HEAD WITH LEADER.

Point Barrow.

Collected by P. H. Ray, after Murdoch.
Cat. No. 56620, U.S.N.M.

passing through a transverse hole above the shoulder. One end is spliced to the thong; the other end makes a couple of turns outside of the lashing between the shaft and the foreshaft. On the side of the shaft and just above the middle is a line catch.

No. 56772 is a similar togglehead harpoon with the line hole in the plane of the blade, foreshaft with square base, spindle-shaped foreshaft, leader looped into the line hole and doubled at the outer end, to be spliced with the end of the line. On the shaft is a hook to be used in tightening the apparatus when the head is in place and also a stop

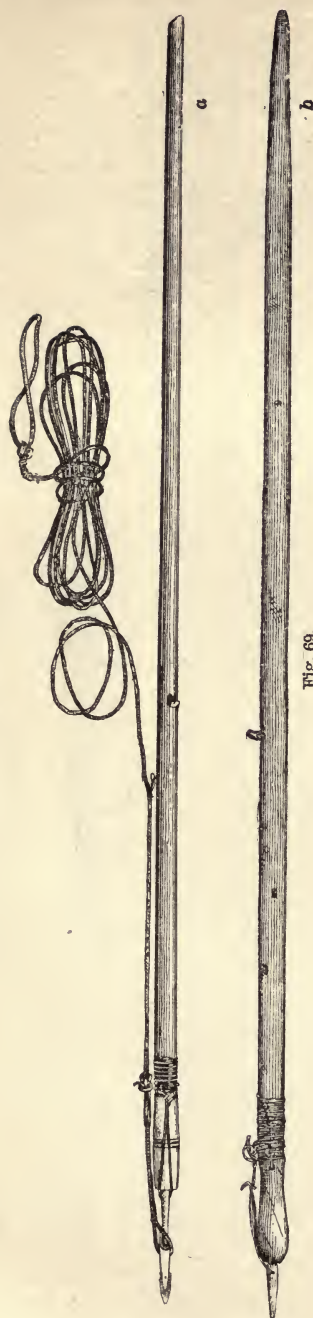


Fig. 69.

WALRUS TOGGLE HEAD HARPOONS.

Point Barrow.

Collected by P. H. Ray, after Murdoch. Cat. Nos. *a*, 56770; *b*, 56772, U.S.N.M.



Fig. 70.

SEALING HARPOON.

Point Barrow.

Collected by P. H. Ray. Cat. No. 56774, U.S.N.M.

for the hand in thrusting. The details of this specimen are carefully worked out by Murdoch (p. 225).

A sealing harpoon (Cat. No. 56774, U.S.N.M.) from Point Barrow, Alaska, collected by P. H. Ray, is shown in fig. 70. With respect to the use of this implement, Murdoch says that as the seals come up for air to their breathing holes or cracks in the ice a harpoon is used which has a short wooden shaft armed with an ice pick, and a long, slender loose shaft suitable for thrusting down the small breathing hole. It carries a toggle head, but has only a short line, the end of which is made fast permanently to the shaft. Such harpoons are used by all Eskimo wherever they are in the habit of watching for seals at their breathing holes. The foreshaft is simply a stout band for the end of the shaft;

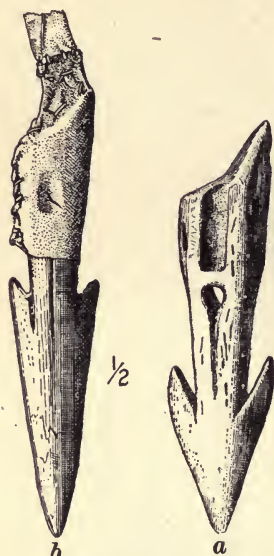


Fig. 71.

OLD BARBED AND TOGGLE HEADS.

Point Barrow.

Collected by P. H. Ray, after Murdoch.
Cat. Nos. a, 89331; b, 8954, U.S.N.M.

An old bone harpoon head (Cat. No. 89331, U.S.N.M.) from Point Barrow, which is a compromise or transition between the barbed harpoon head and the toggle head, is shown in fig. 71a. Two long barbs on the margins are bilateral and symmetrical. Blade transverse to line hole, as in the small seal dart heads. The shaft socket groove is flanked on its margins with slots, through which a thong may have passed to complete the apparatus. Two specimens are figured by Murdoch. Length, $4\frac{1}{4}$ inches. Collected by P. H. Ray, U. S. A.²

Murdoch calls attention, in fig. 71b, to the similarity of No. 89544, U.S.N.M., to a harpoon head collected by Nordenskiöld at the ancient Onkalon house at North Cape.³

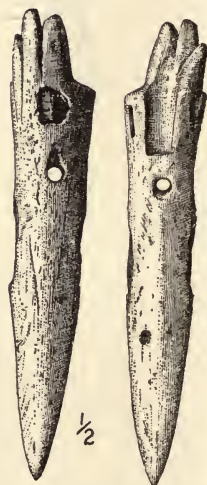


Fig. 72.

OLD TRANSITION HARPOON HEAD.

Point Barrow.

Collected by P. H. Ray, after Murdoch. Cat. No. 89337, U.S.N.M.

¹Ninth Annual Report of the Bureau of Ethnology, fig. 239.

²Sixth Annual Report of the Bureau of Ethnology, p. 220, fig. 209 a and b.

³Ninth Annual Report of the Bureau of Ethnology, fig. 211, p. 220, quoting Voyage of the Vega, I, p. 444, fig. 5.

A bone harpoon head (Cat. No. 89337, U.S.N.M.) from Point Barrow is shown in fig. 72. It marks a step in the transition from barbed head to toggle in that the barbs are absent; a slot on each margin of the body marks the places where they might have been inserted. The line hole is transverse to the blade. The barb of the toggle head is four-pronged and sits awry with reference to the blade. Length, $4\frac{1}{2}$ inches. Collected by P. H. Ray, U. S. A.¹

A combined barbed and toggle harpoon head (Cat. No. 89377, U.S.N.M.) from Point Barrow, rhomboidal in section, conoidal behind the barbs, body all in one piece, of bone or antler, long, slender, tapering from butt to point like a lance blade, is shown in fig. 73. When the line hole is horizontal the blade is vertical. The line hole is a small round perforation. Line grooves, narrow; furrows, uniform.

There were at one time, possibly, barbs on the margins of the blade, for there exists on each, at a distance of 2 inches back from the point, a groove seven-eighths inch long, three-eighths inch deep, and less than one-eighth inch wide, undercut in front. Into this groove or slot could have been inserted marginal barbs of bone, or perhaps of stone. The barb at the butt end is made up of a series of four-lobed projections of different lengths.

The socket is a squared mortise into the bone, with one side quite open. On the margins of this space elongated slots are cut into an open, depressed space on the back, and the socket is completed by coiling around through them a string of animal tissue.

With this specimen should be compared an example from North Cape, with top and bottom barb, oblong line hole decorated by furrows along the sides toward the tip, terminating in two branches and a cross line.² Length of 89377 is 5 inches. Collected by P. H. Ray.³

A combined barbed and toggle harpoon head (Cat. No. 89378, U.S.N.M.) from Point Barrow, of antler, all in one piece, is shown in fig. 74. The body is long, slender, and angular in its outlines, a flat triangle in section in front and pentagonal behind the barb. Line hole straight through very near the butt end and parallel to the plane of the point and lateral barbs. Line grooves deep cut for a small rawhide line.

There are three barbs, one on each margin, acute, the opening two-sided; the rear barb is a sharp termination of the rigid back. Socket for



Fig. 73.

BARBED AND TOGGLE HEAD.

Point Barrow.

Collected by P. H. Ray. Cat. No. 89377, U.S.N.M.

¹Ninth Annual Report of the Bureau of Ethnology, p. 220, fig. 210.

²A. E. Nordenskiöld, Voyage of the Vega, New York, 1882, p. 335.

³Ninth Report of the Bureau of Ethnology, p. 220, fig. 210.

the shaft half an inch deep, butt end cut off, with two faces and a ridge in the middle. Length, $5\frac{1}{2}$ inches. Collected by P. H. Ray. It is well known that all such angular material has been made with steel tools. The only attempt at decoration is a series of four short grooves extending forward from the angles of the lateral barb—a common feature in Eskimo art.

An ivory harpoon head (Cat. No. 89379, U.S.N.M.) from the Eskimo camp near Point Barrow, which marks that step in the transition from the barbed head to the toggle head in which the line hole, line grooves, and shaft socket of the latter are complete, is shown in fig 75. Length, 5 inches. Collected by P. H. Ray.¹ It is compared by Murdoch with a Chukchi form.² The blade is long and tapers backward from the tip to the equal barbs, giving to this part of the specimen the form called sagittate, and occupying two-thirds of the length of the head. The tang of the blade and barbs expands to form the body, through which the line hole passes directly, perpendicular to plane of the blade. The line grooves are straight and uniform in depth. The body widens from the barb on the side that is to become the spur or rear barb, the other side being straight. The shaft socket



Fig. 74.

COMBINED BARBED AND
TOGGLE HEAD.

Point Barrow.

Collected by P. H. Ray.
Cat. No. 89378, U.S.N.M.

is in perfect alignment, and the base is a single gracefully curved plane to the point of the spur.

A curious fragment of a combined barb and toggle harpoon head (Cat. No. 89381, U.S.N.M.) is shown in fig. 76. The parts are all from one piece of ivory; the barbed head is transverse to the line hole, the line hole is somewhat triangular, and the specimen is much discolored and disfigured, showing that it is old. Either owing to the poverty of material or on account of breakage, the after part of the toggle head is too narrow for a socket to the foreshaft. In order to remedy this defect the Eskimo hunter has made a furrow or cavity



Fig. 75.

BARBED AND TOGGLE
HEAD.

Point Barrow.

Collected by P. H. Ray.
Cat. No. 89379, U.S.N.M.

¹ Figured by Murdoch in Ninth Annual Report of the Bureau of Ethnology, p. 220, fig. 211.

² A. E. Nordenskiöld, Voyage of the Vega, New York, 1882, p. 335.

on the side and cut square holes in the margins of this cavity, through which a rawhide line could be run several times, and this would serve the purpose of the socket. This device may be seen on one other specimen in the collection. Collected by Philip H. Ray, Point Barrow.

An old harpoon toggle head (Cat. No. 89382, U.S.N.M.) from Nuwuk, in the Point Barrow region, made of bone, all in one piece, is shown in fig. 77. In fact, it is a barbed head, like that of the seal dart, becoming a toggle head. The part answering to the blade is a point on the bone with a single barb on the lower side or belly. From the base of the barb the body widens to the butt end. The line hole is transverse to the blade. The butt is cut off diagonally. The socket is wanting, but the bone is concave on one side. Mr. Murdoch thinks that a socket was provided by the lashing, as in Example 89381.¹ Length, 3 inches. Collected by P. H. Ray.

An old-style toggle head (Cat. No. 89748, U.S.N.M.)

for a harpoon is shown in fig. 78. The body is of bone, quadrangular in section. The head is of chipped stone, with a tang set into the kerf in front of the body and held in place not by a rivet, but by a lashing of sinew twine. The line hole is at the extremity of the body, where it begins to taper to the spur or barb, which is slightly bifurcated at its outer end. This is called an old-fashioned specimen because the blade of stone is in the plane of the greatest width of the body and is bisected by the line hole.²

A retrieving seal harpoon (Cat. No. 89907, U.S.N.M.) from Point Barrow,

collected by Ray, is shown in figs. 79 and 80. This specimen was supposed by Murdoch to have been invented after the introduction of the rifle, but in his description³ he makes the remark that though it is used at the present day for nothing but retrieving, the fact of similar specimens having been brought by the officers of the *Blossom* shows that



Fig. 76.

COMBINED BARBED AND
TOGGLE HEAD.

Point Barrow.

Collected by P. H. Ray.
Cat. No. 89381, U.S.N.M.

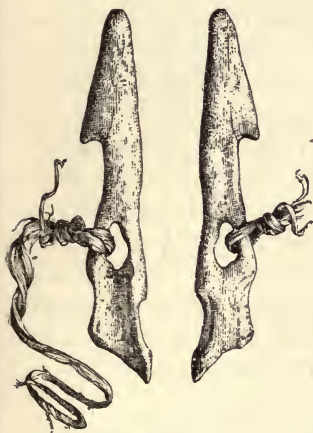


Fig. 77.

OLD TOGGLE HEAD.

Point Barrow.

Collected by P. H. Ray, after Murdoch.
Cat. No. 89382, U.S.N.M.

¹ Ninth Annual Report of the Bureau of Ethnology, p. 219, fig. 208.

² Idem, p. 221, fig. 212.

³ Idem, p. 231.

it antedated the rifle. Such a retrieving harpoon is called *nauliga*. The shaft (*ipúá*) is of ash, 4 feet 5 inches long and 1 inch in diameter, tapering very slightly to each end. The ice pick (*túu*), of walrus ivory, 14 inches long and 1 inch wide, has a round tang fitting into a hole in the butt of the shaft. Close to the shaft a small hole is drilled in one edge of the pick, and through this is passed a bit of seal thong, the ends of which are laid along the shaft and neatly whipped down with sinew braid, with the end wedged into a slit in the wood. The fore-

shaft (*ukumailuta*) is of walrus ivory, $4\frac{1}{2}$ inches long and $1\frac{1}{2}$ inches in diameter at the thickest part, and secured to the shaft by a whipping (*nĩxma*) of seal thong. The loose shaft (*ígimû*) is also of ivory and 2 inches long, and secured by a thong (*ipíuta*) spliced into a loop through the hole at the butt, as previously described. The end is hitched round the tip of the shaft with a marlin hitch, followed by a clove hitch below the whipping. The ivory finger rest (*ti'ka*) is fastened on with a lashing of whip cord (white man's) passing round the shaft. The line catch (*ki'lerbwĩñ*), which was of ivory and shaped like those on the walrus harpoons, has been lost in transportation. The head differs only in size from those intended for the bearded seal, except in having a hexagonal body. It is 3.3 inches long and has a blade of iron fastened into a body of walrus ivory with a single wooden rivet. While there is no detachable leader, the head is attached by a separate piece of the same material to the line (*tũkaksia*), which is 86 feet 10 inches long and made of a single piece of fine seal thong about one-eighth inch thick. This shorter piece is about 27 inches long, and is passed through the line hole and doubled so that one part is a little the longer.

It is fastened strongly to the end of a line by a complicated splice made as follows: A slit is cut in the end of the main line, through which are passed both ends of the short line. The longer part is then slit about 2 inches from the end, and the shorter part passed through the slit, and a slit cut close to the end of it, through which the longer end is passed. The whole is then drawn taut and the longer end clove hitched round the main line.

Catalogue No. 129585 in the U. S. National Museum is a barbed harpoon (for throwing stick) from Cape Blossom, and collected by Capt. M. A. Healy, of the U. S. Revenue Marine. The shaft is of light pine wood, tapering back toward the butt end. It is socketed to receive the shank or tang of the foreshaft, which is plug-shaped and

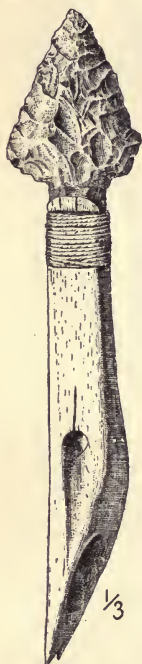


Fig. 78.

OLD STYLE TOGGLE
HEAD.

Point Barrow.

Collected by P. H. Ray,
after Murdoch. Cat.
No. 89748, U.S.N.M.



Fig. 79.

RETRIEVING HARPOON.

Point Barrow.

Collected by P. H. Ray, after Murdoch. Cat. No. 89907, U.S.N.M.

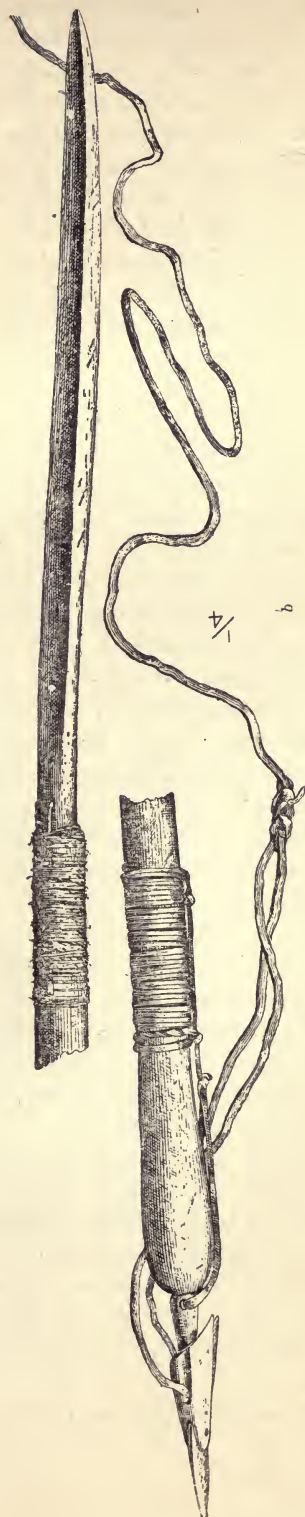


Fig. 80.

Detail of Fig. 78, after Murdoch.

fitted in, all being held together by sinew braid. The foreshaft is of whale's bone, cylindrical. The socket for the point is oblong. Feathers, two, especially noteworthy. The tip end of a half feather is punched into the wood near the neck, bent at right angle and carried forward and lashed down by the assembling line. The fibrous part of the feather is on the inside, between the rib and the shaft of the harpoon. This style of feathering is seen on example 48153, from Sledge Island, with three feathers; on 34020, from Norton Sound, and on several specimens from Golofnin, and does not occur any farther south. The point is of bone, concave on one side and convex on the other. Barbs, three on one margin and two on the other. The tang of the point is wide and flat. The line is of seal hide; martingale formed by splitting the line in the middle and tying the two ends to the shaft. There are two assembling lines—one extending from the upper knot of the martingale to the joint of the shaft and foreshaft, where it forms the seizing between the two; the other begins with the lower knot of the martingale, where one end of sinew thread is punched into the wood, passes backward, and is fastened off by a clove hitch. It then returns to the starting point, where it is again fastened off, and goes on to the feather by a series of turns and half hitches, laid on much as the sinew on the sinew-back bow. This is very interesting. Length of shaft, 44 inches; foreshaft, $4\frac{1}{2}$ inches; point, 2 inches.

Example No. 129574, in the U. S. National Museum, is a barbed harpoon from Cape Krusenstern, Kotzebue Sound. The delicate shaft is conical in shape, tapering from the foreshaft backward, and slightly flattened in its thicker portion. It is socketed in the larger end for the reception of the foreshaft, and slightly stained red.

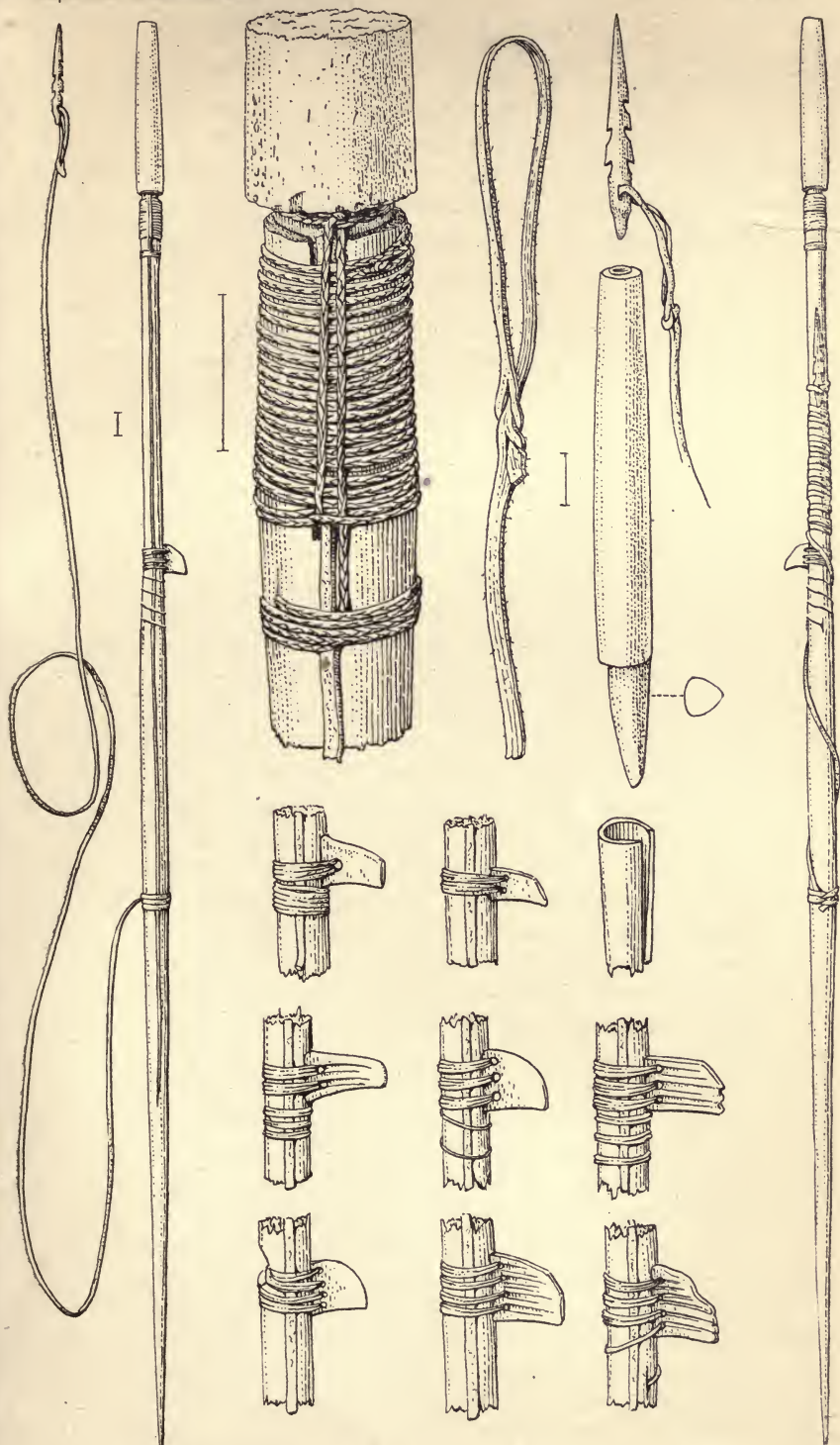
The foreshaft is of whale's bone, cylindrical in shape. The tang fits in the open socket of the shaft, and on the outside the two bodies are trimmed down so as to form one continuous surface. Seizing of sinew twine. The socket for the point is quite large and extends across the wooden plug inserted in the end of the bone.

The hand rest is a slight hook of ivory set in the shaft, pierced with one triangular hole and held by a wrapping of sinew thread, which is also continued around the shaft a dozen times and fastened off by being punched into the wood.

The point is of bone, flat on one side and rounded on the other. Broad shank. Line hole almost circular. Barbs, three on one margin and two on the other. On the flat side of the point a shallow gutter is cut from the line hole forward.

The line is of seal skin. One end passes through the line hole and is fastened by a common slip knot; the other end is made fast to the shaft, about 9 inches behind the hand rest, with a clove hitch of three turns.

The assembling line is of rawhide, one end caught under the seizing



BARBED HARPOON, WITH HAND RESTS, ST. MICHAEL ISLAND, ALASKA.

Collected by E. W. Nelson.

Cat. No. 36068, U.S.N.M.



between the shaft and foreshaft, and the other end pressed into a groove in the wood and held by a small wedge.

This delicate specimen is the only example of the class of barbed harpoons with hand rest coming from a point north of Bering Strait. Length of shaft, 4 feet 3 inches; foreshaft, 7 inches; point, 3 inches. Collected by Capt. M. A. Healy, of the U. S. Revenue Marine.

HARPOONS OF BERING SEA.

The harpoons of this area were fully described and figured by Nelson in 1899, who had the advantage of having seen the specimens at work. The massive harpoons of Greenland and the central Eskimo are wanting here, but the greatest variety of forms and parts is to be found. Again, if the flat varieties of eastern Asia, with line hole in the plane of the blade, are the more aboriginal, their nearest kin are to be seen, not in Bering Sea, but around Greenland. It is as when an Oxford professor, wishing to know something of his old-time kin, visits, not the nearest English town, but the heart of some New World colony. The Bering Sea Eskimo have been profoundly affected by the vigorous prosecution of the fur trade during the past century and a half. The possession of steel tools has revolutionized their fine art; but, fortunately for this study, the harpoon has kept more loyally to its ancient models. There are barbed varieties, toggle varieties, and some are mixed. There are those which are thrust with the hands, others are hurled from the hand, and very many are cast from throwing sticks. Of this last-named implement a number of type forms are to be seen between Mackenzie River and Sitka. Here also will be found feathered harpoons, those with bladders attached to the shaft, and harpoon arrows. In the more southern portions of the Bering Sea area the harpoon attains a finesse in structure and appearance nowhere else seen. The collections from this area made by Nelson, Turner, Dall, Applegate, and Johnson are unparalleled for comparative study.

Among a large collection of these seal darts or barbed harpoons from Unalakleet, in the northeast corner of Norton Sound, a great majority have cylindrical foreshafts made of whale's bone, but one or two specimens have the heads of walrus ivory and the front end tapered in conical form. Farther south this characteristic is more abundant. Barbs on the points are three on one margin and two on the other, and two on one margin and one on the other.

According to Lucien Turner, the harpoon darts with very thick foreshafts and elongated bladders attached to the shaft are for salmon. They are confined to Bristol Bay and the south side of the Alaskan peninsula, so far as the U. S. National Museum is concerned.

Cat. No. 33859 in the U. S. National Museum is a barbed harpoon thrown from the hand by means of a hand rest on the shaft. Quite similar is No. 36068, as shown in Plate 8, described in Nelson, 1899.

(p. 138). Unless otherwise mentioned the specimens described below were collected by E. W. Nelson.

The shaft is of soft wood, tapering backward to a point, oval in cross section, and stained red in the front portion. For the attachment of the foreshaft a roughly conical socket is excavated, and on the upper side of this socket a slot is cut through from the outside. In the harpoons whose foreshafts are attached in this way this slot is universal—that is, the tang of the foreshaft is not driven into a cavity which it fits, but is set in a cavity with two margins which can be driven close together by the shrinkage of the seizing.

The foreshaft is of whale's bone, nearly cylindrical, and cut off square in front. The tang is conoidal in form and terminates with a shoulder where it joins the body of the foreshaft. A plug of wood is inserted in the front end of the foreshaft, with a socket for the tang of the point. Feathers, none; but on the side of the shaft, just behind the center of gravity, is a flat piece of antler or bone set on and held in place by a lashing of rawhide thong. This serves as a stop for the end of the harpoon, the latter being driven like a javelin from the hand, without the use of a throwing stick of any kind.

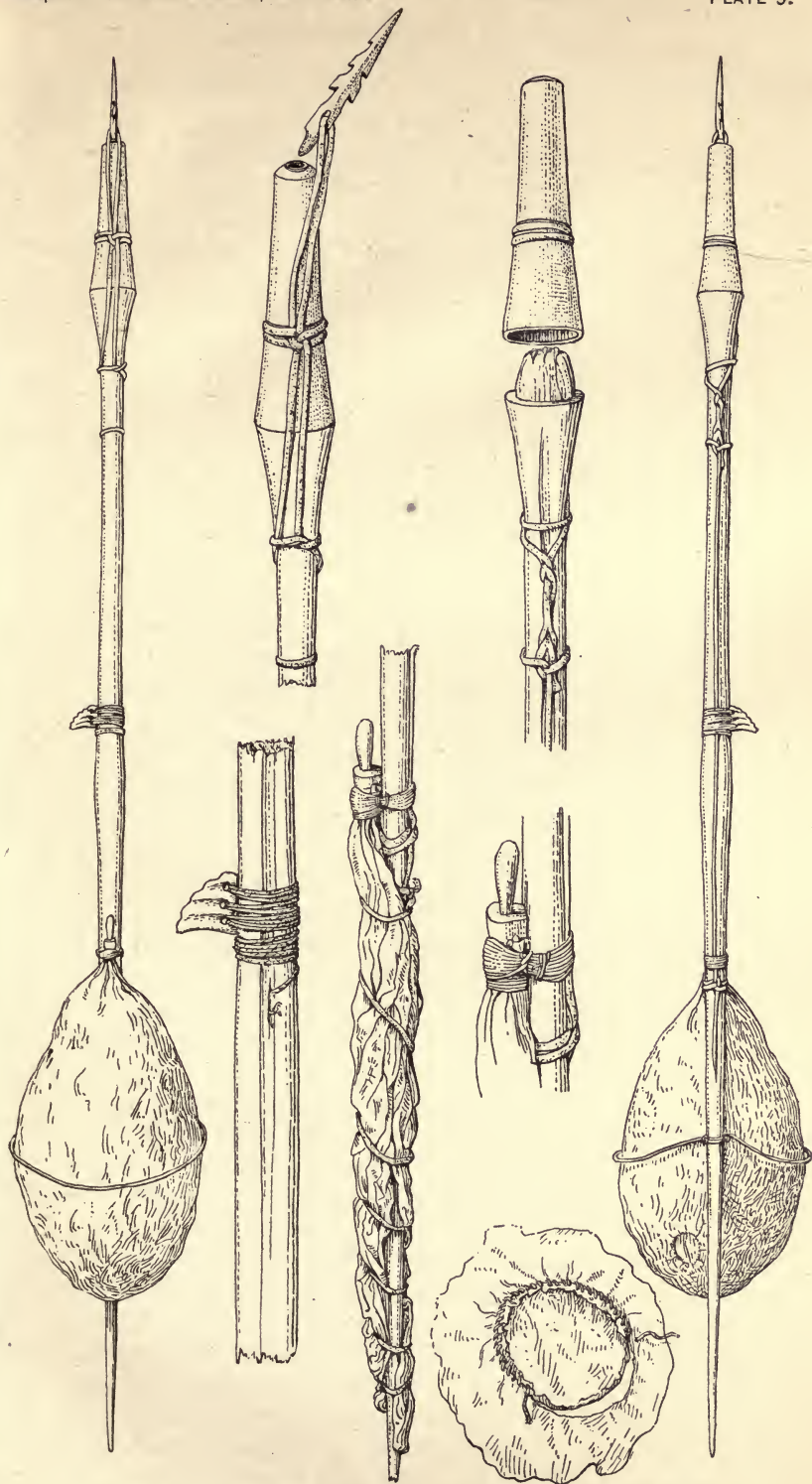
The point is of bone, flattened on one side and round on the other, much larger than that of the variety hurled with a throwing stick. The shank is a flattened cone. Barbs, three on one margin and two on the other. In all of this class of harpoons the edges or sides of the point are sharp, and the margins of the barb are straight on one side and curved on the other. The line hole is oblong.

The line is of rawhide thong, one end attached to the point and the other end to the shaft back of the middle by a clove hitch.

The assembling line is fastened around the tang of the foreshaft near the shoulder and is continued back underneath the lashings, of different kinds, to near the top end, where it is driven into the wood and forms a smooth fastening.

Length of shaft, 52 inches. Length of foreshaft, 8 inches. Length of point, 4 inches. This specimen is from St. Michael. Collected by E. W. Nelson.

A toggle-head harpoon (Cat. No. 33888, U.S.N.M.) from Norton Sound is shown in fig. 81. The head is of ivory. The noticeable features about it are: The blade is in the same plane as the line hole; the line hole goes directly across the body of the head; the shallow socket is exactly behind it and in a line with the saw cut. There is a single barb or spur projecting behind the socket on top of the toggle head. The foreshaft is a long spindle of bone, tapering in front to fit the socket of the toggle head, and having a short cone at the base for the cavity in the end of the foreshaft. A hole is pierced through the foreshaft and a loop or becket passed through this opening and around the line, so that when the animal is struck the foreshaft is withdrawn from



BARBED HARPOON, WITH HAND REST AND BLADDER, NORTON SOUND.

Collected by E. W. Nelson.

Cat. No. 33933, U.S.N.M.

the head and remains attached to the line. This feature should be carefully noted. The shaft is of wood, the fore-shaft of ivory, and swollen or bulbous at the outer end. It fits into the wedge-shaped cut on the end of the shaft and is held tight by a lashing of rawhide. This lashing continues the whole length of the shaft, being caught around it at intervals with half hitches, forming an assembling line. Attached to the shaft is a hand rest about the center of gravity and a sharpened piece of bone at the other end. The line from the toggle head, after passing through the loop on the loose shaft, is attached to the shaft about the middle, so that the latter forms a drag when the animal is once struck. This implement is not thrown by means of a throwing stick, but from the hand of a hunter. Collected by E. W. Nelson.

A barbed harpoon (Cat. No. 33910, U.S.N.M.) from the Norton Sound area, to be thrown from the hand and not from a throwing stick, is shown in fig. 82. The shaft tapers from the front to the rear end, and has a hand rest on the side, held down by sinew thread. The foreshaft is a cylinder of bone, and fits into the open socket of the shaft by means of a projection or tenon. The harpoon head is a barbed piece of bone. The line passes through the line hole in the head and is wrapped several times around the shaft, fastened off with a series of half hitches, and nearer to the butt end. The assembling line, in this example, is different from the one just described. When the animal is struck, the head is withdrawn from the foreshaft, the thong unwraps from the shaft, which stands straight in the water and acts as a drag to the captured animal. It is from St. Michael.

A barbed harpoon with hand rest (Cat. No. 33933, U.S.N.M.), from St. Michael, Alaska, is shown in Plate 9. The shaft is of pine wood, elliptical in section, pointed in the rear, widening toward the middle and then narrowing again toward the foreshaft. The foreshaft is of bone or antler, a flat cylinder in section and a truncated cone in outline. It has a hole in the base and is fitted over a projection or tenon in the end of the shaft. This method of joining is worthy of notice. The shoulder of the shaft forms a neat joint with the rear of the foreshaft. In the middle



Fig. 81.

TOGGLE HEAD HARPOON.
Norton Sound.

Collected by E. W. Nelson.
Cat. No. 33888, U.S.N.M.

of the body of the foreshaft a gutter is carved to receive the knot in the line. A hand rest on the middle of the shaft is triangular in outline, with a wavy margin and short flutings on the surface. It is pierced with three holes and set against the side of the shaft, where it is laid in place by wrappings of sinew thread. The fastening off of the lashing by being punched in the soft tissue of the wood is quite characteristic in Eskimo manufactures. The head has three barbs, one on one margin and two on the other, and is flattened on one side and angular on the other. The tang is flat and shouldered. The line hole is an oblong opening, just large enough to hold the rawhide thong and give it play. The line, which serves also for assembling line, is of stout sealskin. The small bladder is attached to the shaft. Its mouthpiece and lashings are well shown in the drawings.

Specimen No. 33948 in the U. S. National Museum is a bridle harpoon for a throwing stick, from the mouth of the Yukon River, collected by E. W. Nelson. The shaft is of light pine wood, top-shaped at the tip, suddenly narrowed, and then gradually widened to the butt end, where it is quite expanded. It is socketed for the shank of the foreshaft. The foreshaft is of ivory, attached to the shaft by a tang which fits into the socket. It is perforated just below the shoulder for the reception of a loop of rawhide, which is caught on either side under the seizing, binding the shaft and foreshaft together. This serves as an extra strengthening or as a retrieving device. The tip end of the foreshaft is tapered and a wooden plug inserted for the reception of the point. Two whole feathers are attached in the usual manner, punched into the wood, all their tip ends and the butt ends held down by a wrapping of the assembling line. The assembling line passes from the front end of the shaft to the inner end of the feathers. The point is of ivory, line hole oblong, tang conical, with a shoulder. Martingale of sinew string, the two ends fastened in the usual place—one near the foreshaft, the other back of the middle, fastened by a clove hitch. The assembling line acts as a lashing for the shaft and the foreshaft, passes backward by the regular series of half hitches, and is fastened off at the butt end as a seizing to the feathers.

Especial attention is called to the hole near the tang of the foreshaft; a similar hole is found through the inner end of the



Fig. 82.

BARBED HARPOON.

St. Michael Island.

Collected by E. W. Nelson. Cat. No. 33910, U.S.N.M.

foreshaft near the tang. This peculiarity is almost entirely confined to the area between Cape Dall and Nunivak. Length of shaft, 46 inches; foreshaft, 5 inches; point, $3\frac{1}{2}$ inches.

Specimen No. 33952 in the U. S. National Museum is a barbed harpoon without bridle for throwing stick, from Askeenuk, below Point Dall, collected by E. W. Nelson. The shaft is of light pine wood, nearly uniform thickness throughout, slightly expanded at the butt, and cut into a truncated wedge in front, which fits into a smaller slot in the foreshaft. The foreshaft is of ivory, almost cylindrical, and a little expanded in the front and tapering toward the tip, into which a plug of wood is inserted for the reception of the tang of the point. Into the butt end of the foreshaft is sawed a wedge-shaped slot on the ends of the wings. These formed projections are left for the lashing which joins the two parts together. The lashing is also held in place at the other extremity of the joint by shoulders on the foreshaft wrapped with sinew braid, which forms a strong joint. Three feathers are pressed into the wood near the butt end and wrapped with sinew braid at their inner extremities, the braid continuing to form the assembling line of the shaft. Here, as in other examples, a dozen or more turns are closely wrapped around the shaft about a foot from the end. The point is of bone. Barbs, three on one side and two on the other. Line hole oblong and quadrangular. Tang conical and shouldered. Through the line hole is fastened a narrow sealskin thong 3 feet or more long. This is attached by its other end around the shaft near the joint with the foreshaft by a clove hitch. When the point is driven into a seal by means of a throwing stick, the tang is withdrawn from the foreshaft, which sinks in the water, and the shaft floats with the feathers upward to act as a buoy and also as a drag to slacken the pace of the animal. Similar to this are Nos. 33950, 33949, 33954, and 33955. In all of these the line is fastened to the shaft near the foreshaft. Length of shaft, $44\frac{1}{2}$ inches; foreshaft, $6\frac{1}{2}$ inches; point, 3 inches.

Examples Nos. 34004, 34011, 34016, 34020, 34002, 34008, 34017, 34022, 34018, 34001, 34023, 34014, 34003, 34021, 33992, 33991, 33999, 33994, 33978, and 33995 in the U. S. National Museum are barbed seal harpoons for throwing sticks, and form a large collection of these objects from various places around Norton Bay. They have foreshafts of whale's bone, cylindrical, attached to the shaft by a shank fitted into a socket in the end of the shaft.

The shank of the foreshaft is somewhat wedge-shaped in cross section, the edge of which is run through a slot extending from the outside to the inside of the end of the shaft, to allow the shrinking of the sinew wrapping on the outside to bind all the parts strongly together.

Most of these specimens from this area have two feathers, though in some cases there is only one.

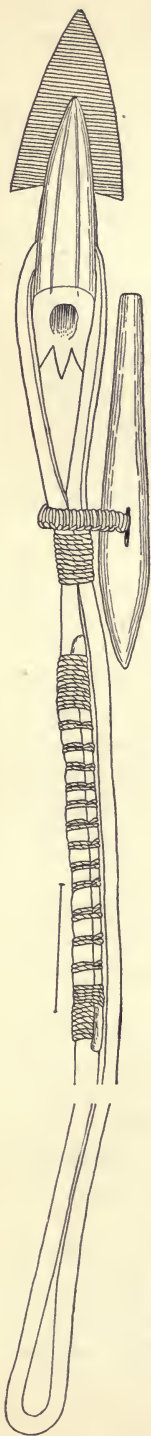


Fig. 83.

TOGGLE HEAD AND ACCESSORIES.

Kuskokwim River.

Collected by E. W. Nelson. Cat. No. 37380, U.S.N.M.

The head and contiguous parts of a small toggle harpoon (Cat. No. 37380, U.S.N.M.) for seal, from Chalitmut, collected by E. W. Nelson, is shown in fig. 83. The body of the head is of ivory, somewhat rectangular in cross section, but carved and flattened on both sides in parts of threes. The blade is set into a saw cut at the tip of the head and not held by any rivet. The socket for the loose shaft is a slender cone truncated within, the front end of the loose shaft being sawed off. The butt end of the body is beveled out. A long slope and three barbs are formed at the hinder edge of this bevel and ornamented with concentric circles and lines. The line hole passes straight through the body, as in many other examples of this type. The loose shaft is a spindle-shaped piece of bone, longer on the front slope. The hinder end is sharpened to fit into a groove. In the end of the foreshaft a hole is bored through the thick portion of the loose shaft, and through this hole and around the leader or line is formed a grommet of sinew cord. The two ends of the leader are overlapped and united by a notch.

A small toggle harpoon (Cat. No. 37395, U.S.N.M.) of the Alaskan Eskimo, at Chalitmut, on the north of Kuskokwim Bay, is shown in fig. 84. It is a type of the region and is made with a great deal of artistic skill. Blades are nowadays of brass, copper, and other metals, often of slate, inserted into a small toggle head of ivory transversely to the plane of the barbs, the plate intersecting the barb, which is bifurcated and sometimes trifurcated. The body is also ornamented with graceful lines, herring bone patterns, and circles. Into the socket of the headpiece is inserted the point of a small bone loose shaft, which fits by its lower end into a shallow socket of the foreshaft. Through the line hole of the head is a loop of rawhide, the ends neatly spliced together by a frapping with sinew string. The loose shaft is kept from being lost by a little grommet, made of sinew passing through

it and around the rawhide loop. The whole work of all these specimens is very neatly done. Length of head, $1\frac{3}{8}$ inches. Collected by E. W. Nelson.

Catalogue No. 37955 is a toggle head of seal harpoon. The parts of this specimen which are attached are the head, with its loop or leader, and the loose shaft, with its runner or grommet of rawhide passing over and inclosing the leader of the head.

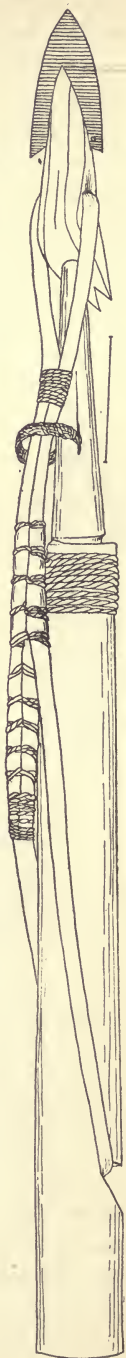
The body is of bone or ivory in the form of a flattened cone. The spur is beveled and curved up at the point. Two delicate barbs are parallel on the outside and divided by a furrow along the back. Blade of iron, triangular, with convex edges, inserted in the blade slit and riveted. Plane of the blade parallel with the line hole. Shaft socket in the spur narrow and deep. Line hole transversely through the body. Line grooves extended to the end of the barbs and ornamented with engraved lines. Leader of rawhide, neatly spliced by seizing at the ends, and the space between lashed with double hitches passing between the rawhide ends. A narrow seizing holds the two elements close to the toggle head. It may be questioned whether the peculiar curves of back and belly give the head a start in toggling itself in the wound.

Foreshaft of bone, spindle-shaped, and attached to the loop of the toggle head by a small running loop or grommet of rawhide.

Length, $3\frac{1}{8}$ inches. Eskimo of Sfagamute, north of Bristol Bay. Cat. No. 37955, U. S. National Museum. Collected by E. W. Nelson.

The illustration in Plate 10 shows the construction of the larger Bering Sea harpoons (Cat. Nos. 43346 and 153727), cast from the hand, and used in killing large seals, walrus, and white whales. They have stout wooden shafts, from 4 to 7 feet long, with a hand rest near the center made of bone or ivory, neatly fitted on and held in place by a lashing of baleen, rawhide, or sinew cord. The foreshaft is of bone and ivory, neatly fashioned, fitted to the end of the shaft by a tenon and socket, and held firmly by a seizing of baleen. The foreshaft is pierced near its base for the line which holds all the parts together, and has a socket on top for the loose shaft.

FIG. 84.
TOGGLE HEAD AND ACCESSORIES.
Kuskokwim River.
Collected by E. W. Nelson. Cat. No. 37395, U.S.N.M.



At the butt end of

the shaft is a bone pick, attached by a wedge-shaped joint, the bone fitting into a kerf in the wood. The upper part of the pick is bored through for the assembling line. Around the joint is a lashing of baleen, neatly laid on, the assembling line being neatly interlaced with the wrapping. Especial attention is called to the fastening off and the knots on the shaft. The foreshafts of the large Bering Sea harpoons belong to the two quite distinct forms, the spindle-shaped and the conoidal. On the left side of Plate 10 is shown the form and mounting of a spindle-shaped loose shaft, and on the right side that of a conoidal form. In this example the projection is on the loose shaft and the socket in the foreshaft. In both forms a hole has been bored through the loose shaft for the assembling line. In these harpoons the heads belong to Murdoch's later type; that is, the blade and line

hole are in the same plane, at right angles to the longest diameter of the cross section of the toggle head. The blades of these harpoons are of slate, iron, brass, and, in a few specimens, of jade-like material. The toggle head is attached to the main line by means of what Murdoch calls the leader, which is a stout rawhide thong, 1 to 2 feet long, passed through the line hole, the two ends being overlapped and seized together; near the head a few turns of fine thong or sinew twine hold the two sides of the loop together, forming a becket. At the other end the leader is spliced into a becket on the end of the line. The line, when the head is ready for action is "done up" on the shaft, the far end being securely tied. When the game is struck, the head is withdrawn, the loose shaft unstripped, the line unrolls, and the shaft acts as a drag.

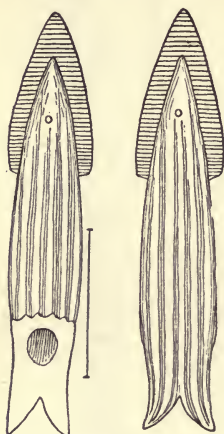


Fig. 85.

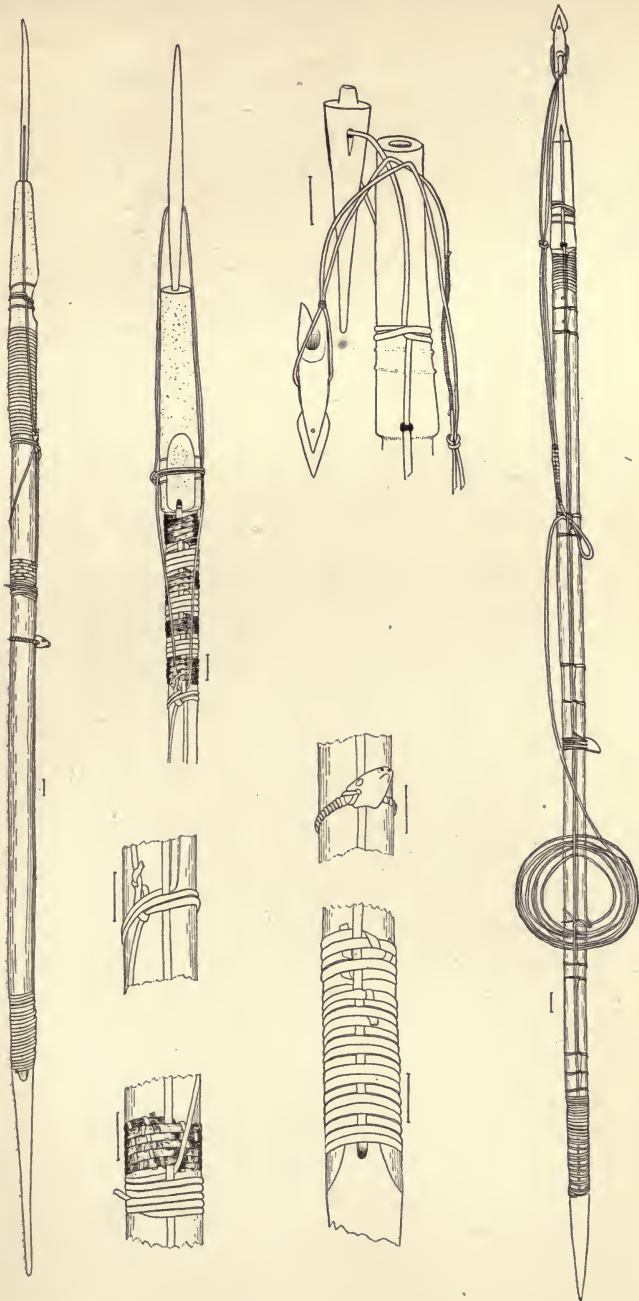
TOGGLE HEAD.

Cape Nome, Alaska.

Collected by E. W. Nelson. Cat.
No. 44484, U.S.N.M.

An artistic little toggle head of bone and iron from Cape Nome (Cat. No. 44484, U.S.N.M.), on the northern shore of Norton Sound, is shown in fig. 85. Body is somewhat pyramidal, the upper and lower surface being elegantly fluted and ridged. The blade is deltoid, with square butt and slightly convex margins, set deeply into the tapering point of the body in the plane of the line hole and fastened with a bone rivet. The line hole passes straight through the body of the toggle head, the ends being flanked by triangular line grooves. Barbs, two cocked up and flared outward and bounded by the ornamental ridges, which closely follow the outlines of the back and terminate gracefully in the tips of the barbs. Butt end a curved plane, upright below and tapering above.

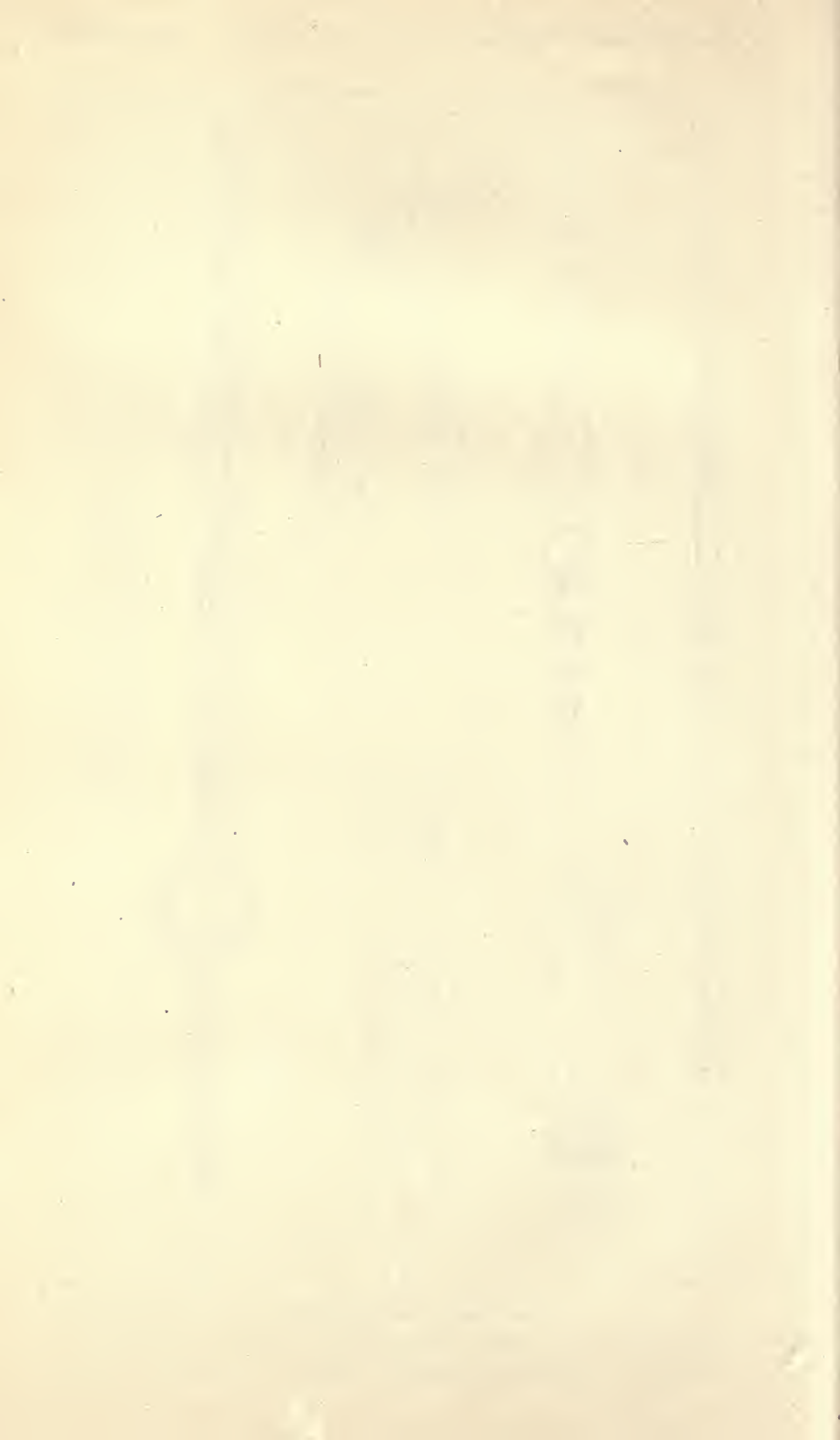
A cast-iron toggle head (Cat. No. 44747, U.S.N.M.), from Sledge Island, Alaska, just south of Bering Strait, all in one piece—exactly



LARGER BERING SEA HARPOON.

Collected by E. W. Nelson.

Cat. Nos. 43346 and 153727, U.S.N.M.



similar to the little seal harpoon heads of ivory—blade of iron, and bifurcated barbs, is shown in fig. 86.

Collected by E. W. Nelson. This is the last word in the inventional history of the toggle harpoon head. From this point it enters the world-embracing commerce, being cast in metal and sold to island peoples all about the Pacific Ocean. It has no voice in settling the question how far similarities in aboriginal arts argue for contact or sameness of mind and its environments.

Specimens Nos. 45429 and 45430, in the U. S. National Museum, are barbed harpoons from Cape Nome, the northwestern corner of Norton Sound, Alaska. These are similar to the Sledge Island specimens without feathers, one of them having the assembling line of sinew thread and the other of rawhide.

The measurements of No. 45429 are: Shaft, $45\frac{1}{2}$ inches; foreshaft, 4 inches; point, 3 inches. Measurements of No. 45430 are: Shaft, 46 inches; foreshaft, 4 inches; point, $2\frac{3}{4}$ inches.

A bone toggle head (Cat. No. 46154, U.S.N.M.) of medium size, from Port Clarence, just south of Bering Strait, Alaska, is shown in fig. 87. Body conoidal in form, elliptical in section, and higher than broad. Blade of iron, deltoid in form, set deeply in the slit and riveted with bone or wood. Line hole straight through, wider behind and run out into well-defined line grooves. Barbs two, formed by the bifurcation of the back, being angular, cocked up, and flared out. Socket for the foreshaft shallow and having a sharp edge on the butt, which is a single curved surface, nearly perpendicular below, quite elongated above the socket. Length, $3\frac{1}{2}$ inches. Collected by Dr. T. H. Bean. Of similar character to No. 46154 are many other pieces in the Museum. In fact, when the shape arrives at a certain stage beyond the inventor, it seems to turn into the highroad of mechanical monotonies.

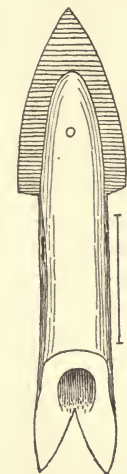


Fig. 87.

TOGGLE HEAD.
Port Clarence,
Alaska.

Collected by T. H.
Bean. Cat. No.
46154, U.S.N.M.

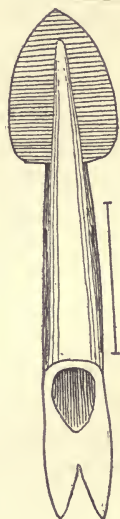


Fig. 86.

IRON TOGGLE HEAD.
Sledge Island.
Collected by E. W. Nel-
son. Cat. No. 44747.
U.S.N.M.

Plate 11, Catalogue No. 48156 in the U. S. National Museum, is a barbed seal harpoon projected from a throwing stick, from Sledge Island, on the northwestern shore of Norton Sound, collected by E. W. Nelson. The shaft is of light pine wood, tapering gently from tip to butt and slightly flattened in cross section. The tip end is socketed for the reception of the tang of the foreshaft. The peculiarity of four specimens from this locality is that the socket is split very little on the

outside, to allow for shrinkage in hafting. The foreshaft, as in most other specimens, is of whale's bone and cylindrical. The shank for fastening to the shaft is shouldered and notched for the attachment of the assembling line. No feathers; but on another specimen, No. 48153, three half feathers, with plume inside, attached to their ends, as in example No. 129585, from Cape Blossom. The point is of bone, flat on one side and rounded on the other. Barbs, three on one margin and two on the other. The shank of the point is flat. The line is of dark seal rawhide, attached by one end through the line hole of the point by means of two double splices an inch apart. It is split near the middle, the two ends being fastened to the shaft about 18 inches apart by means of a clove hitch.

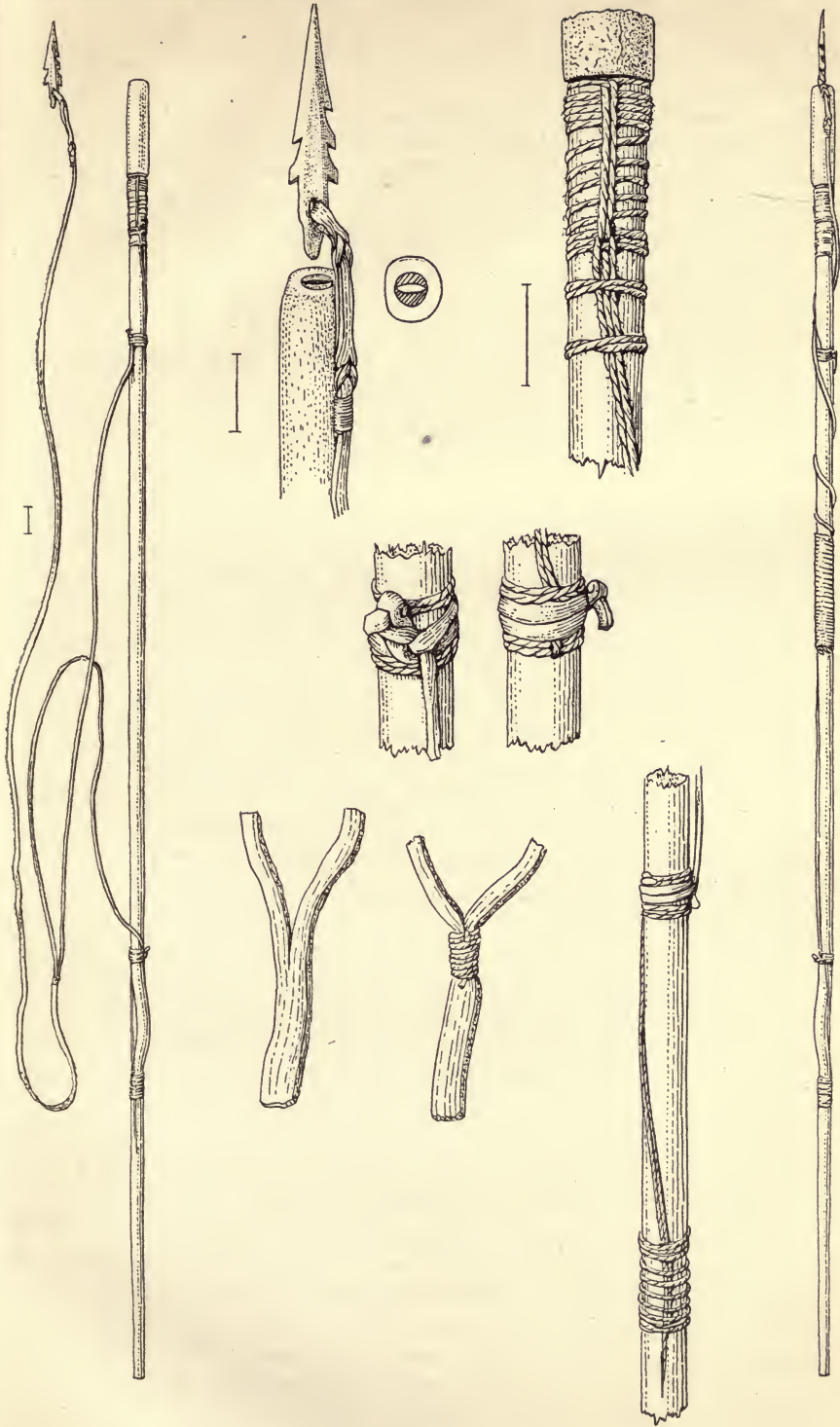
The front assembling line is looped around the shank of the foreshaft by a clove hitch wrapped around the end of the shaft to prevent slipping, and is continued to the upper attachment of the martingale. Between its two knots the martingale acts as an assembling line. From the hindmost knot of the martingale an assembling line of sinew thread proceeds backward for 4 inches, where a dozen turns are made and the end is punched into the wood near the end of the shaft. Between the two knots of the martingale the shaft has been mended by a series of half hitches and clove hitches made in sinew thread.

In specimen No. 48154, from the same locality, the upper assembling line is in fine seal rawhide. Length of shaft, 46 inches; foreshaft, 4 inches; point, 3 inches.

Specimen No. 48365 in the U. S. National Museum is a barbed harpoon for throwing stick, from Nunivak Island, south of Yukon mouth. The shaft is of soft wood, nearly uniform in thickness throughout, truncated and wedge-shaped at the upper extremity to fit into a corresponding cut in the foreshaft. Especial attention might be called to the expansion of the small end of the wedge to correspond with depressions in the shouldering on the parts of the foreshaft which overlap the wedge, in order to prevent the joint from coming apart. This is a step toward a dovetail.

The foreshaft is of walrus ivory, slightly expanded in front and conoid on the top. The tang has a wedge-shaped saw cut to fit on the end of the shaft. The two flanges are shouldered where they join the body of the foreshaft, and have notches cut on them at the outer extremity for the lashing. This is driven on the end of the shaft and the two are seized together by means of sinew braid laid on neatly. A small plug of wood is inserted in the outer end of the foreshaft, having a conical socket for the butt end of the barb.

At the base of the shaft there are two sets of black feathers, one above the other. Each feather is whole, its inner end seized to the shaft by means of the assembling line, which is wrapped several times



BARBED HARPOON FOR THROWING STICK, SLEDGE ISLAND.
Collected by E. W. Nelson.
Cat. No. 48156, U.S.N.M.

around. The top ends of the feathers are firmly driven into holes in the wood.

The head is of ivory, flat on one face and angular on the other. The shank is nearly conical, fitting into the socket of the foreshaft. Line hole elongated. Barbs, three on one margin and two on the other.

The line or martingale of the harpoon is of rawhide; the undivided end is passed through the line hole of the head and tied in a bowline knot. The two ends of the martingale are attached to the shaft near the feather and near the foreshaft by clove hitches. The sinew braid by means of which the shaft and foreshaft are seized together is continued on toward the feathers, with here and there a half hitch, until it reaches the rear feathers, where it forms the seizing, and then passes backward to become the seizing of the front set of feathers, and it is fastened on by being punched into the wood in a similar way to the top end of the feathers.

Among the Eskimo tools there is a little ivory point belonging to the outfit of the bow-and-arrow maker, used especially for making holes in soft wood, into which the ends of feathers and lines are punched to form a smooth fastening. It seems to be very effective. Length of shaft, 3 feet 7 inches; length of foreshaft and shank, $7\frac{1}{2}$ inches; length of point, 3 inches. Collected by E. W. Nelson.

A sea-otter harpoon dart Pishudak, (Cat. No. 72415, U.S.N.M.), from Bristol Bay, Alaska, is shown in Plate 12. In its composition it resembles a large number of specimens used in an important industry. It will be described, therefore, in detail. The head is of ivory, flat on one side and angular in section on the other. There are three barbs, two on the left margin, one on the right; the line hole is oblong. The tang fitting into a socket at the end of the foreshaft is a little cone, shouldered above. The line is of braided sinew, fastened into the line hole of the barbed head by a bend and knot. The other end in this and kindred specimens has not the martingale, but is tied to the shaft near the middle of the bladder. When the animal is struck, the barbed head pulls out from the foreshaft, the line unrolls from the shaft, the bone head drops, and the bladder rises. The apparatus acts then both as a drag and a signal. The foreshaft, of bone, is bill-shaped, cut off square at the base, excepting a slight tenon in form of a cylinder to fit into a socket at the front end of the shaft. In the front end of the foreshaft a cylinder of pine wood is set, and this must be noted on all barbed harpoons. The purpose is to give the tang of the head a firmer hold when the weapon is ready for action. The shaft of this and other like specimens is of wood, tapering just slightly from front to rear. The socket for the tenon of the foreshaft is carefully bored, and wrapped with sinew braid. The same braid is continued down the shaft for assembling line, and serves also for attaching the float, which in all small harpoons of this class is made from

bladders, stomachs, or intestines of seal or walrus. They are cleaned out, one end fastened up securely, and into the other a mouthpiece with plug is set for purpose of inflation. The subject is discussed by Nelson.¹ In the example shown the process of inserting a stud or plug into the float where it has been pierced is illustrated. Length of shaft, 44 inches; length of foreshaft, $2\frac{1}{2}$ inches; length of barb, $4\frac{1}{2}$ inches. Specimen No. 11356 is quite similar. Length of shaft, $46\frac{1}{4}$ inches; length of foreshaft, 3 inches.

Examples No. 8004 to 8007 in the U. S. National Museum are feathered harpoon darts from Bristol Bay. The shaft is very little expanded in front and slightly expanded at the nock. There are three half feathers neatly trimmed and bound on in front by the assembling line which is also used to seize the foreshaft, wrapped around the shaft and ends at the feathers. The feathers are seized at the nock with a strip of split quill and are further held in place by a thread which holds the mid-rib of the feather to the shaft of the dart at five places. The feather seizing at the nock is noticeable in all of these specimens and separates them from the others in the collection.

The foreshaft, of ivory, is conical, smaller at the butt end, where it is inserted into the shaft by means of a shoulder plug which is driven into the socket at the end of the shaft. The front end of the foreshaft is abruptly conical and finished off with a wooden plug which has a pit or socket for the barbed point. The point is of bone and has two barbs on one side and one on the other. Length of shaft, $44\frac{1}{4}$ inches; of foreshaft, $5\frac{1}{2}$ inches; of point, 3 inches. Collected by Dr. T. T. Minor. Similar to these are Nos. 19378 and 19380, collected by the Rev. James Curley, having in all respects the same characteristics, excepting that the seizing at the nock is not of quill, but a continuation of the thread which holds the shaft of the feather to the shaft of the spear.

Plate 13 (Cat. No. 90416, U.S.N.M.) is a sea-otter spear from Ugashik, Bristol Bay, Alaska. The shaft is of wood, tapering from the fore end to the rear end. The head is of bone and has two barbs on one margin and one on the other. The line hole is small and has no line grooves. The tang is whittled off thin to fit into a delicate socket on the end of the shaft. The leader or loop on the barbed head is a narrow strip of sealskin doubled through the line hole and seized together. The ends are also united in such a way that the loop is closed in the middle. At the other end the thong is doubled, passed through an eyelet, over the projecting point to form a "detacher." On the shaft at five places are bands of birch bark and around these are wrapped sinew twine in half hitches for the purpose of retrieving the parts of the shaft if it should be broken. The bladder is a portion of the intestine of a seal, having

¹ The Eskimo about Bering Strait, 1899, pp. 40 to 145.

a delicate mouthpiece of ivory, neatly set on to the side of the shaft by wrappings of sinew thread passed through two holes bored in its upper portion. The other end of the bladder is bound to the rawhide thong, which is secured by being pushed under the wrapping of sinew thread between it and the birch-bark packing. The line is of rawhide and is securely fastened to the "detacher" at one end by a bend, which is held in place by a figure-of-8 wrapping of sinew thread. The rest of the line is wound about the shaft when the spear is ready for action, the other end being attached to the shaft between the two ends of the bladder. When the animal is struck, the head unships, the line unrolls, the head of the shaft drops into the water and the whole acts as a drag and a signal to show the position of the game.

Examples Nos. 90417 to 90419 in the U. S. National Museum are feathered sea-otter harpoon darts from Ugashik, north of the Alaskan peninsula. The shaft is of light pine wood, very nearly cylindrical, and tapering slightly toward the front. The foreshaft is of bone and has a plug on the inner or butt end which fits into a socket on the end of the shaft, and the joint is seized by a fine sinew or intestine braid, the inner end of which is continued backward with half hitches for an assembling line. Near the feather a band of this braid an inch in width is formed, and 4 inches above the feather is another one around the inner end to the feathers. There are three feathers, seized in front by the assembling line, and at the nock by a separate wrapping of braid. They are split and further held down by a light thread, which binds the shaft of them to the shaft of the dart in five places by half hitches.

This method of attaching the feathers is found in Nos. 8004 to 8006 and seems to be typical of the region.

The line or martingale is attached to the shaft 4 inches behind the foreshaft and 4 inches in front of the feather. The point is small and has three barbs on one side, and is attached to the line by means of a hole bored in the shank and fitted into the foreshaft by a tang which is nearly cylindrical. Length of shaft, 4 feet; of foreshaft, $5\frac{1}{2}$ inches; of point, $1\frac{1}{2}$ inches. Collected by William J. Fisher.

The darts are called Nagik kujat; the bone foreshaft, Mamkuk; the line, Punak; the bone head, Kugichalugak; the feathers, Nakchute.

A complete toggle harpoon (Cat. No. 160337, U.S.N.M.), with line float and line board, from Kusilvak, at the mouth of the Yukon River, in Alaska, is shown in Plates 14 to 15. The toggle head shown in Plate 15 is of ivory, a delicate object, perfect in all its details. In outline it resembles the head of a duck. The blade is set into the saw-cut at the point of the body, and in the plane of the line hole, which is bored straight through from margin to margin. The barb is cut into three points, which form a part of the ornamentation. Through the line hole passes a long loop, which is neatly spliced at its ends and wrapped

and knotted so as to keep it in shape. At its other extremity it unites with the end of a long rawhide line, which in turn is looped at its other end to a becket or loop of sealskin float, and frequently an additional line is spliced between the two. This line rests upon a flat board frame, which is thus described.¹

The float board consists of a strong, oval hoop of spruce made in two U-shaped pieces, with the ends brought together and beveled to form a neatly-fitting joint, which is wrapped firmly with a lashing of spruce root; the sides have holes by which a thin board is fastened to the under side, the ends of which are notched in front to form a coarsely serrated pattern with five points that are inserted in slots cut in the front of the hoop. The front of the board is oval, and the sides taper gradually to the points of two projecting arms, which extend 4 or 5 inches below the bow; between these arms a deep slot is cut, with the inner border rounded. The board has a round hole in the center and a crescentic hole on each side (Plate LIV, fig. 10).

On the *kaiak* the float board is placed in front of the hunter with the arm-like points thrust beneath the cross lashing to hold it in position, and upon it lies the coil of float line with the spear attached and resting on the spear guards on the right rail of the boat; the end of the line is passed back under the hunter's right arm to the float, which, fully inflated, rests on the deck just back of the manhole.

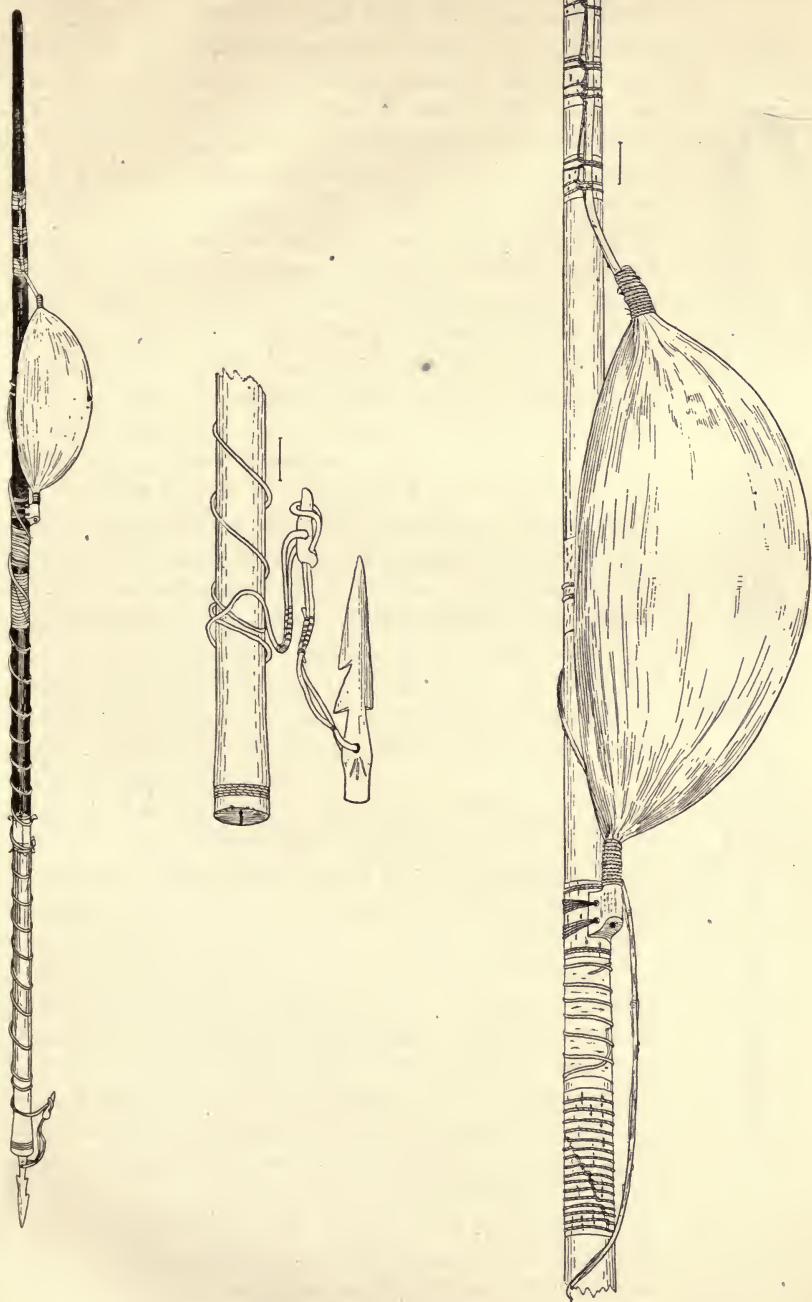
When the spear is thrown, the coil runs off rapidly and the float is thrown overboard. In some cases, when the prey is vigorous and leads a long pursuit, another line, like that shown in figure 9, Plate LIV, is made fast through the semilunar orifices in the center of the float board, which latter, when drawn through the water by means of this cord, assumes a position nearly at a right angle to the course of the animal and forms a heavy drag to impede its progress.

When hunting on the ice, the float board, with the line coiled upon it, is carried in the left hand of the hunter and the spear in the right hand while he watches along the borders of the leads or holes for the appearance of the seals. When he succeeds in striking one, he holds firmly to the line until the animal is exhausted, or, if necessary, the float board attached to the line is cast into the water, while the hunter hurries to his *kaiak* and embarks in pursuit.

In plate 15 will be shown the method of uniting the toggle head with the loose shaft, this with the fore shaft, and the fore shaft with the shaft. This last joint is worthy of study, with its curious tenon and shoulder fitting into a socket at the end of the shaft. Especial attention is called to the manner in which the shaft is cut away a short distance on the outside to allow the lashing of sinew to draw the joint perfectly tight. Attention is also called to the method of fitting the splicing, at which the Eskimo are quite adept. On the surface of the fore shaft the dot and ring ornaments occur. This decoration, wherever found, is an emblem of the existence of steel tools. Very little ornament exists on the old Eskimo weapons found in localities away from contact.

The head of a toggle harpoon (Cat. No. 168625, U.S.N.M.) from Bristol Bay, collected by William J. Fisher, is shown in fig. 88. The head is of bone, back sharp edged, front rounded, and the whole a flattened wedge shape at right angles to the line hole. The blade, of slate, is triangular, with convex sides, and glued into a saw cut in the end of the head. This socket for the loose shaft is square in section and shallow. The butt end of the body is beveled as in most harpoons of this class, but in such manner as to form an offset on the margin of the socket, and

¹ Nelson, *The Eskimo about Bering Strait*, 1899, p. 138.



LONG-HANDLED BARBED HARPOON, BRISTOL BAY, ALASKA.

Collected by William J. Fischer.

Cat. No. 90416, U.S.N.M.

the single barb is formed by the meeting of the sharp back with the two edges of this bevel. The line hole passes straight through the body and is flanked by shallow wide grooves. The loose shaft is a piece of pine wood flattened and wedge-shaped at its butt end to fit into a wide socket at the end of the foreshaft, shouldered about 2 inches from this end and then tapering to the point of juncture with the body of the toggle head. The loose shaft passes into the shallow socket of the head, where it is hinged. A rawhide thong is passed through the line hole and tightly seized on either side of the loose shaft 3 inches below its outer end. This forms a hinge, so that when the body of the toggle head is drawn down the point of the loose shaft comes out of the socket, and the parts are held together by the wrapping or seizing. The two are further secured together by a grommet of spruce root. When in rest the wedge-shaped butt end of the loose shaft passes between the two sides of the rawhide line, and in unhinging from the toggle head this part also flies out in an opposite direction. At the end of the rawhide line is a loop for the attachment of a longer line.

This old example is very interesting indeed, forming a connecting link between the Eskimo toggle head and the forms allied to it among the Indian tribes farther south. Length of head and blade, $6\frac{1}{2}$ inches; loose shaft, $9\frac{1}{4}$ inches.

Plates 16 and 17 (Cat. Nos. 16407, 19382, and 72412, U.S.N.M.) show the forms of harpoon arrows in use on the north and the south side of the Alaskan peninsula. The last mentioned, No. 6 on the plate, from Bristol Bay, is farthest removed from the arrow and nearest the harpoon with its club-shaped head and bilateral barbs. The line hole in the barbed head, the line running from head to shaft, the socket for the head, the joint between head and shaft, are all suggestive of the small seal harpoon. No. 5 on the plate, from Cook Inlet, in its head approaches very near to the simplicity of the Fuegian barbed harpoon. The half feathers set on radially are more Indian than Eskimo. Fig. 4 on Plate 16 is the delicate sea-otter arrow from Kadiak, the paragon of aboriginal projectiles. The specimen is fully illustrated on Plate 17.

This is the most elaborate and ingenious arrow known, and all of its parts, in every specimen, are most delicately finished. Such a weapon may well have been used in hunting the most costly of fur-bearing animals—the otter.

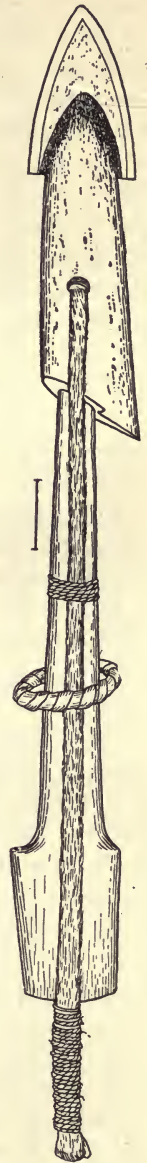


Fig. 88.

TOGGLE HARPOON
HEAD.

Bristol Bay.

Collected by Wm. J.
Fisher. Cat. No.
168626, U.S.N.M.

The shaft is of spruce, gently tapering toward the neck, which is large and bell shaped. Into the end of the shaft is inserted a foreshaft of bone, and into the end of this fits the barb. Feathers, three, symmetrically trimmed and seized at both ends with delicately twisted sinew thread. The barbed head is perforated, and through these perforations is attached a braided line at least 10 feet long. The other end of the shaft is secured to two points on the shaft by a martingale. When not in use the line is coiled neatly on the shaft and the barb is put in place in the foreshaft. When the arrow is shot, the barb enters the flesh of the otter, the loose fastening is undone, the line unrolled, the foreshaft drops into the water; the shaft acts as a drag and the feathers as a buoy to aid the hunter in tracing the animal. (See Plate **LII**, fig. 4.)

Fig. 1. Arrow with line unrolled, showing relation of parts.

Fig. 2. The shaftment. Attention is drawn to the delicate seizing with sinew thread, the natty trimming of the feather, the most efficient nock.

Fig. 3. The lines and knots. Notice is given of the elegance of the braid, the efficient manner of "doing up" the line, the peculiar knot for the martingale.

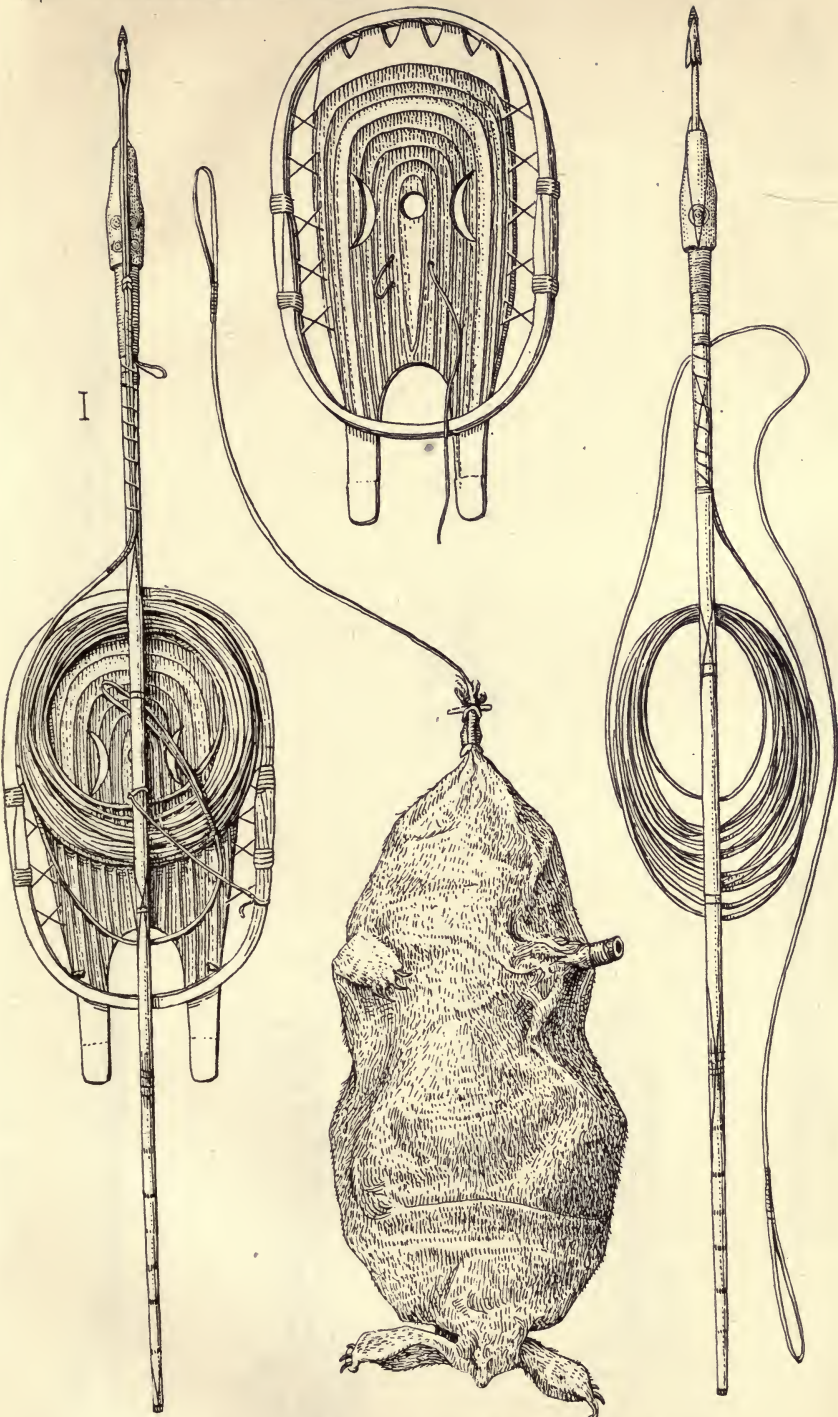
Fig. 4. The arrow ready to be shot.

This form of arrow, with its southern type of sinew-backed bow, is found also on the Kuriles, where they were taken by Aleuts, carried over by the Russians to hunt sea otter.

The arrows numbered 1, 2, and 3 in Plate 16 are from the same areas as the harpoon arrows just described, namely, from Bristol Bay to Kadiak. The heads are essentially those of harpoons, and are set into the ends of the shafts in the loosest manner by a slight conical projection fitting into a socket. When the animal is struck the head withdraws itself and remains in the wound. A short piece of string between head and shaft would convert these three missiles into harpoon arrows. To make the likeness more complete, No. 3 has a wooden cap over the blade.

Cat. No. 72518 in the U. S. National Museum is a sea-otter harpoon dart or Pishudak from Chernoborn Island, Cook Inlet. The bladder, shaft, assembling line, foreshaft, martingale, and barb are similar to the others in all respects excepting the attachment of the foreshaft to the shaft. A projection from the butt of the ivory foreshaft forms a wedge which tapers in two directions. In fact, the foreshaft is dove-tailed into the end of the shaft and seized with a sinew braid or sennit, which acts as the assembling line. See Plate 16 for details of Cat. No. 19382, a harpoon arrow from the same locality. Length of shaft, 45½ inches; of foreshaft, 3 inches; of point, 5 inches. Collected by William J. Fisher.

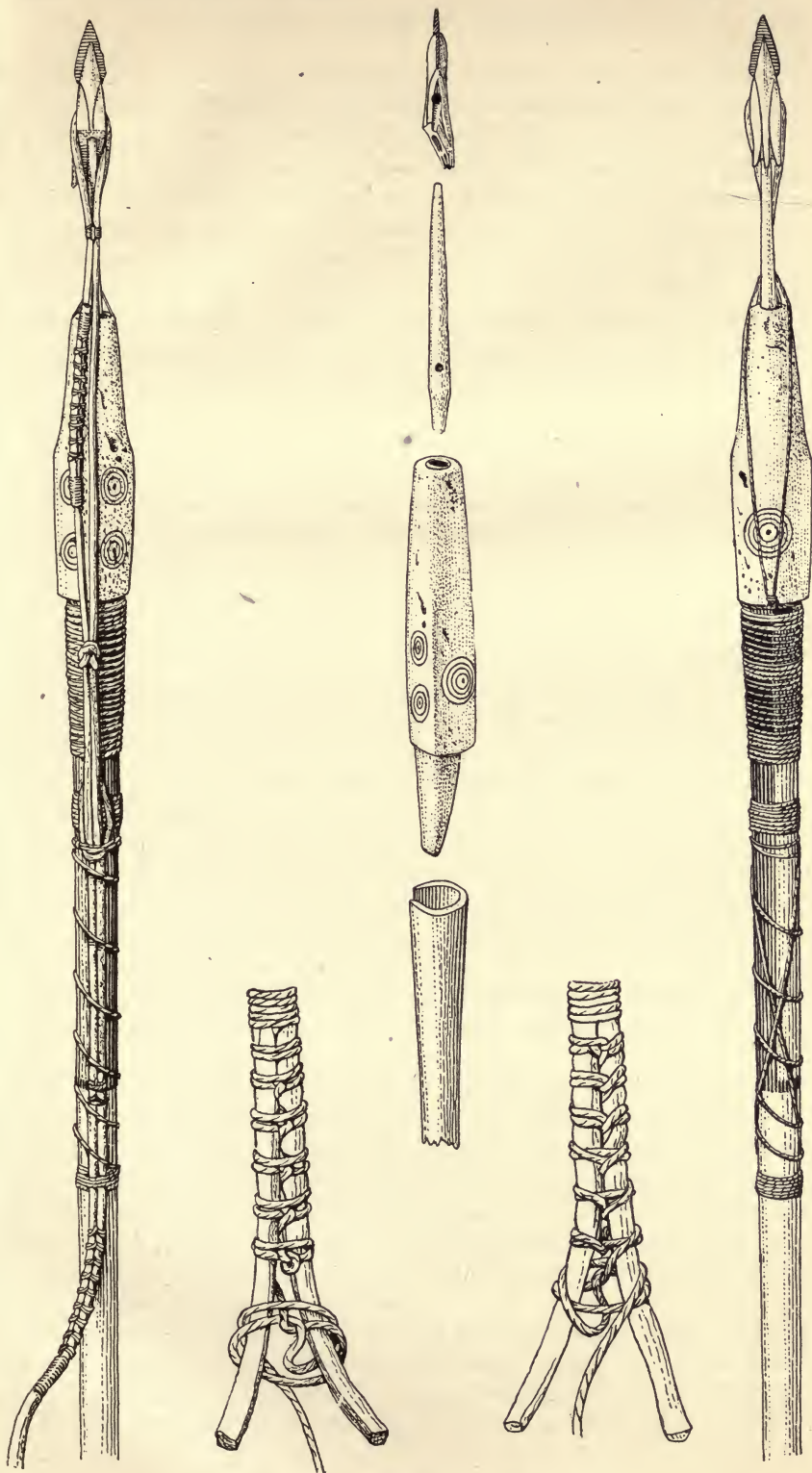
Plate 18, Cat. No. 175825 in the U. S. National Museum, is a sea-



TOGGLE HARPOON, LINE, AND FLOAT, KUSILVAK, YUKON RIVER.

Collected by E. W. Nelson.

Cat. No. 160337, U.S.N.M.



DETAIL OF KUSILVAK HARPOON IN PLATE 14.

otter dart from Unalaska. The shaft is of spruce wood; it is light and delicately made, not quite cylindrical, but becoming thicker toward the front. The foreshaft is of whale's bone, thicker where it joins the shaft, tapering smaller towards the front, and expanding at the tip end; flattened a little in cross section. A plug of wood is inserted in the socket at the tip end. The point of ivory has two barbs on one side and one on the other, and an extension or knob at the butt end, around which the line is fastened by a marlin hitch. The line is of sinew braid or sennit three-ply in the open parts, and six-ply between the martingale and the point. The martingale is tied, one end around the foreshaft and the other a little back of the middle of the shaft, by a clove hitch.

The shaft has in front a wedge with square front and shouldered in the rear. This wedge fits exactly into a slot in the butt end of the foreshaft. A small piece of birch bark is wrapped around the joint for packing and all the parts seized together very neatly with the finest sinew thread.

In this example, as in all others of its class, the shaft is painted red; on some of them the paint extends to the foreshaft. On a few examples bands of black paint are added at the butt end. Length of shaft, 42 inches; of foreshaft, $7\frac{1}{2}$ inches; of point, $2\frac{1}{4}$ inches.

Feathers on the shaftment or butt end of the shaft, three, set on radially. The nock of this specimen is not unlike the foreshaft in form, only, in place of the notch to fit the bow string, there is a flat cone on the tip end with a small pit on the end to catch into the ivory hook on the foreshaft. By comparing this specimen with the harpoon arrows in Plates 16 and 17 the student has the best possible opportunity of seeing the close kinship between the harpoon and the arrow. It is entirely a matter of propulsion, whether from the hand, from a bow, or from an atlatl or throwing stick.

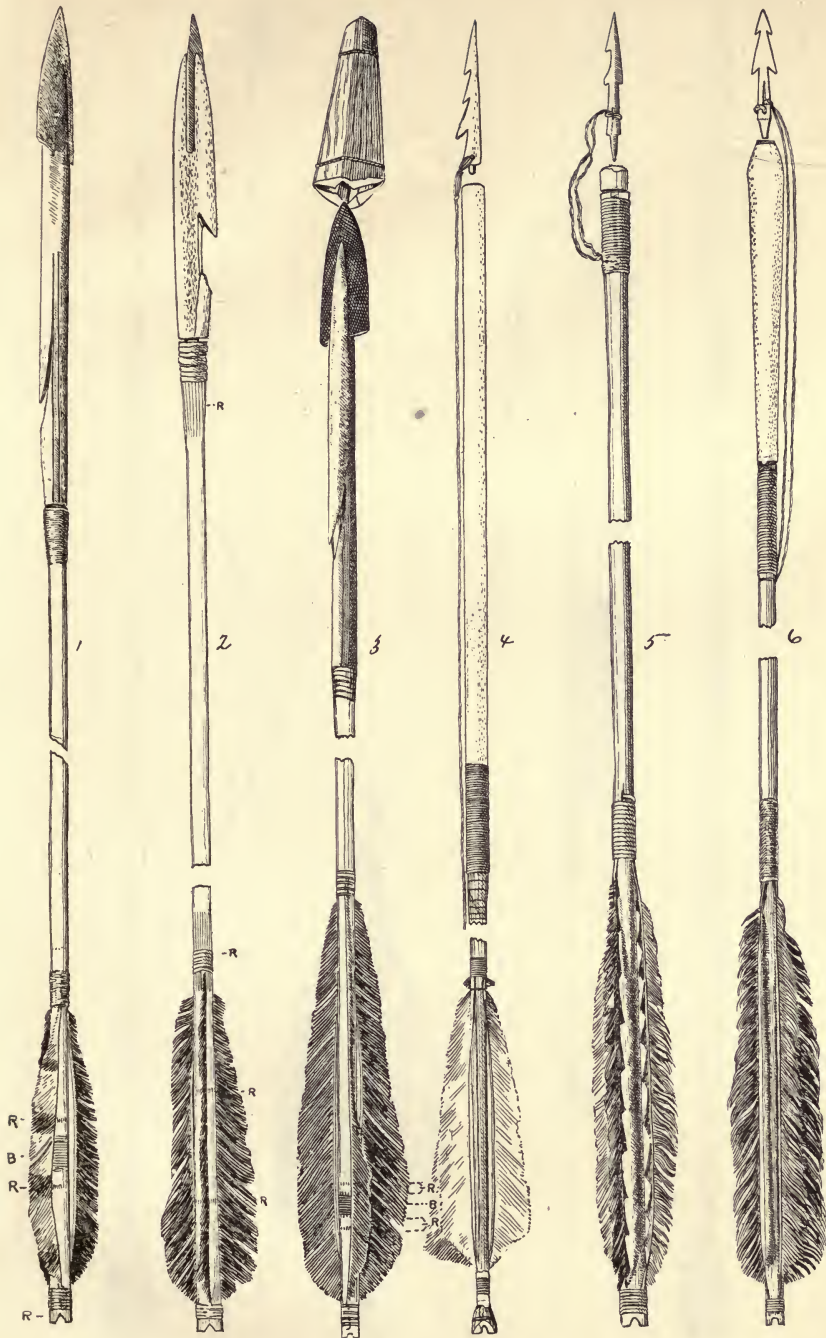
Plate 19 (Cat. No. 11362, U.S.N.M.) represents a barbed harpoon with bladder and hand rest. From Kadiak, and collected by Vincent Colyer.

The shaft is of pine wood, tapering gradually from the point to the butt. At the front end the shaft is widened out into a cylindrical form for about 2 inches and notched in like a spool. There is no foreshaft in this specimen. The socket for the point is lenticular in cross section and the spool-shaped space is filled with a wrapping of fine sinew braid. The shaft is ornamented with rings and longitudinal stripes in black, and the space between the two attachments of the martingale is painted solid black.

The point is of walrus ivory or hard bone, delicately made. There are two barbs on one side near the butt, which at a side view resemble the hoof of an animal. At the inner margin of one of these, three little dots and lines are added by way of ornament. On the

other side is a small barb or hook, which could scarcely be of any use. The tang is not tapered or shouldered, but is quite wide. The line hole is round, and into it is set a thong of rawhide, doubled and joined together at its ends and likewise near the barb by a lashing of sinew thread. Just above the point, where the two ends of the thong are bound together with sinew thread, a braided cord of sinew passes between the two ends of the thong and is made fast by a half hitch, a knot being tied in the end of the braid to prevent its coming undone. The braid constitutes the line of the harpoon. A few feet from the point, where the braid is attached to the rawhide leader of the barbed head, it is separated into two smaller braids, and these become the branches of the martingale, the ends of which are attached, one under the bridle, the other 3 feet from the front end of the shaft. The hand rest is a short piece of the black horn of the mountain goat. Its base fits on the shaft. Through a hole in this horn a lashing of sinew thread passes around the shaft several times. The bladder has at one end a delicate mouthpiece of ivory set against the shaft, held in place by sinew thread passing through perforations in the mouthpiece. At the other end the bladder is attached to the shaft by means of a rawhide thong tied a few inches away. At five different places on the shaft, namely, the two points of attachment for the martingale, the place of the hand rest, and the two points of attachment for the bladder, are bands of white birch bark, which serve both for ornament and as a soft packing to hold the different lashings in place. The manner in which the line is done up on the shaft when the harpoon is ready for action, by means of a loose knot, which is easily untied, is shown. In every respect this is a well-made and graceful implement. Length of shaft, 8 feet 5 inches; point, 8 inches.

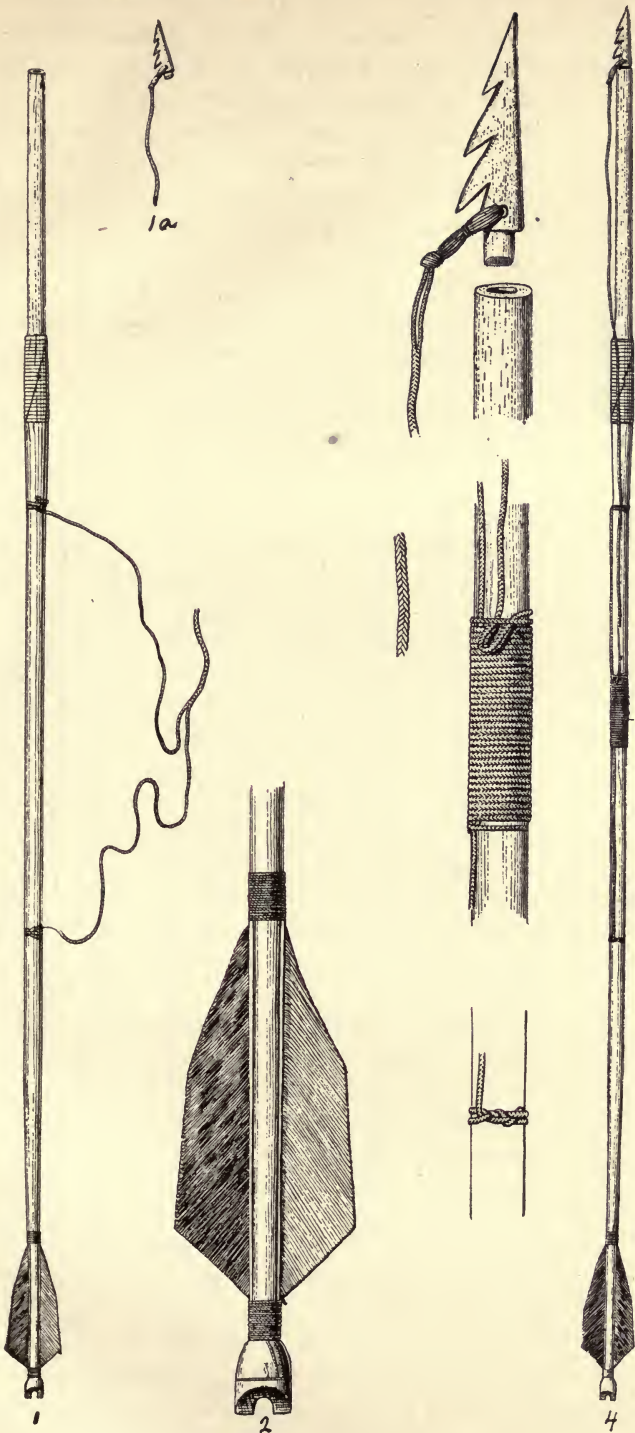
The Samoyed harpoon, on the testimony of Nordenskiöld, consists of a large and strong iron head, very sharp on the outer edge and provided with a barb. The head is loosely fixed to the shaft, but securely fastened to the end of a slender line 10 fathoms long, generally made of walrus hide. The line is fastened at its other end to the boat, in the fore part of which it lies in a carefully arranged coil. There are from five to ten such harpoon lines in every hunting boat. When the hunters see a herd of walrus, either on a piece of drift ice or in the water, they endeavor, silently and against the wind, to approach sufficiently near to one of the animals to be able to harpoon it. If this succeeds, the walrus first dives and then endeavors to swim under water all he can. But he is fixed with the line to the boat and must draw it along. His comrades swim toward the boat, curious to ascertain the cause of the alarm. A new walrus is transfixed with another harpoon, and so it goes on until, one after another, all the harpoons are in use. The boat is now drawn forward at a whizzing speed, although the rowers hold back with the oars; but there is no actual danger so long as



BARBED SEA OTTER HARPOON ARROWS, ALASKAN PENINSULA.

Collected by W. H. Dall, James Curley, and Charles L. McKay.

Cat. Nos. 16407, 19382, 72412, U.S.N.M.



DETAIL OF SEA OTTER HARPOON ARROW ALASKAN PENINSULA.

all the animals draw in the same direction. If one of them seeks to take a different course from that of his comrades in misfortune his line must be cut off, otherwise the boat capsizes. When the walruses get exhausted by their exertions and by loss of blood, the hunters begin to haul in the lines. One animal after another is drawn to the stem of the boat, and there they commonly first get a blow on the head with the flat of a lance, and when they turn to guard against it a lance is thrust into the heart.¹ Whatever view one takes regarding the blood kinship between

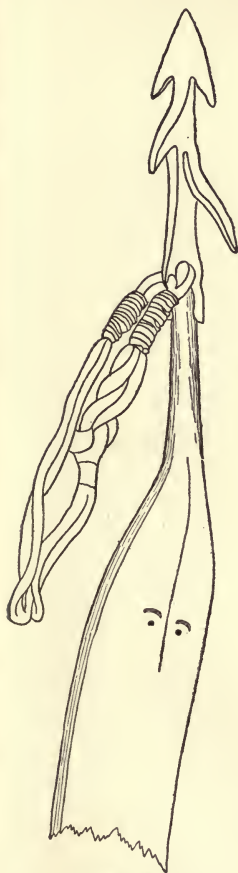


Fig. 90.

IRON TOGGLE HEAD.
Amur River.
After von Schrenk.

the peoples of northeastern Asia and those of North America, or between the languages of the two areas, the kinship of inventions is not to be denied. How far a device may travel or be transmitted without changing so much as one word in any language or one drop of blood is not known. A whale has been known to carry a harpoon head half way around the world and deliver it safely to a company of natives on the other side; and a throwing stick, with which harpoons are hurled, drifted from Bering Strait to western Greenland.

The harpoon has been briefly traced throughout the Western Hemisphere. It remains to notice one or two forms in which the sailor and the blacksmith have supplanted almost entirely the aboriginal mechanic. Boas figures an iron toggle head (1888, p.473) now in the Berlin Museum of Ethnology. It is of iron, preserves the general shape of the native barbed and toggle head, the blade, spurs, and line hole being in parallel planes. The natives, according to Boas, also file these heads out of bits of iron.

The end of the line is bent, run through the line hole, and fastened down by a compound splice (fig. 89). The fact has been already mentioned that toggle heads of bone were made wholesale



Fig. 89.

MODERN HARPOON
HEAD OF IRON.
Cumberland Sound.
In Berlin Museum für
Völkerkunde, after
Franz Boas.

¹ A. E. Nordenskiöld, *Voyage of the Vega*, I, 1881, p. 156.

in former times, and traded to the Eskimo for valuable furs. In the National Museum there is among the Nelson collection a small toggle head of cast iron all in one piece, fig. 86, the model of which was a native example of ivory and iron.

Fig. 90 is taken from Schrenk,¹ and shows the same invasion of iron into native arts. The object is a combined barbed and toggle head, in which, however, the barbs play the chief part. The leader, of rawhide, preserves its ancient bends and knots, and the eyes peeping from the foreshaft are certainly survivals of the ancient régime.

A harpoon (Cat. No. 19518, U.S.N.M.) from Cumberland Sound, collected by George Y. Nickerson, is shown in fig. 91. It is an interesting mixture of ancient forms with modern. The shaft is a well-turned, spindle-shaped piece of oak wood. The hand rest is an old ivory piece, turned at right angles, set into the shaft for a short distance, and bound on with two seizings of sinew braid. Just below the hand rest is an iron loop through which the liner runs. The foreshaft is a long bar of iron, set into the head of the shaft and packed, the joint being made fast by means of an iron ferrule. Near the inner end of the shaft is a padding

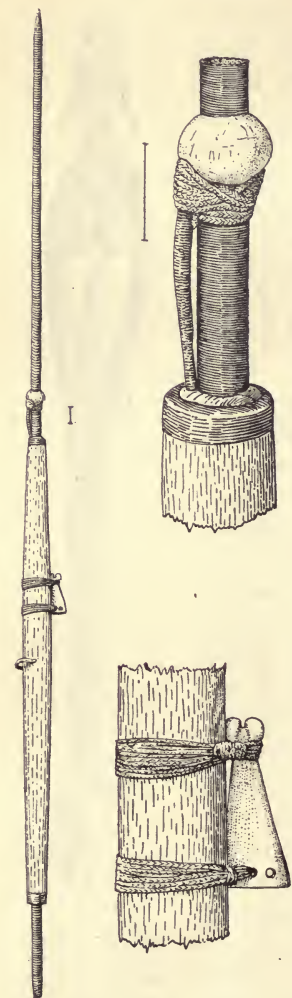


Fig. 91.

SHAFT OF TOGGLE HARPOON.
Cumberland Sound.

Collected by Geo. Y. Nickerson. Cat. No.
19518, U.S.N.M.

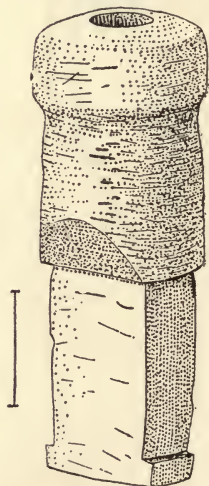


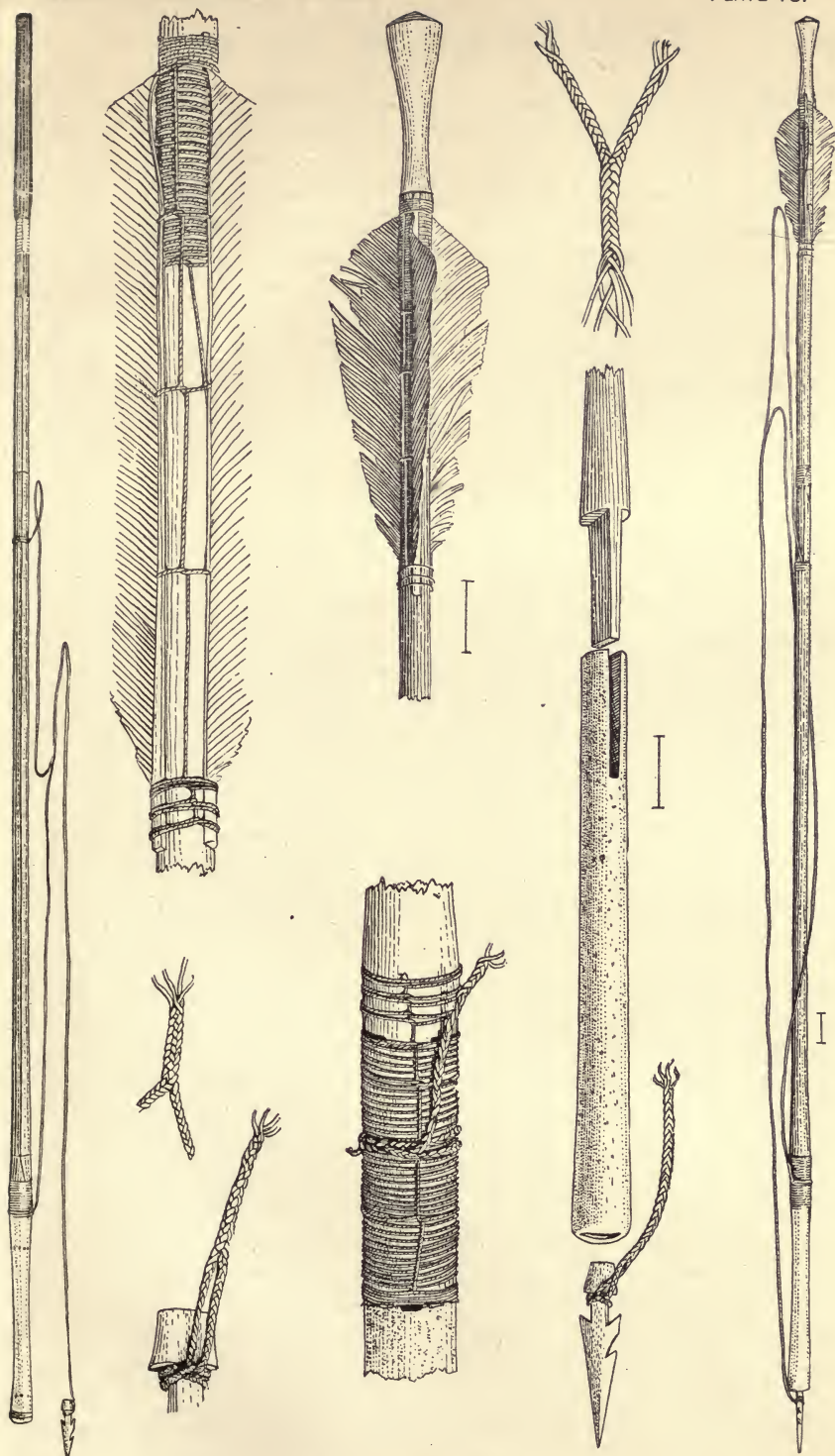
Fig. 92.

BONE FORESHAFT OF HARPOON.
Bristol Bay.

Collected by Charles McKay. Cat.
No. 72403, U.S.N.M.

of rawhide, connected a few inches away with the end of the shaft by a stiff rawhide sprig. The object of this ball is not known, but it may have acted as a buffer for catching the blow. The ice pick at the butt end of the shaft is also

¹ Plate 42, fig. 2.



BARBED HARPOON DART FOR THROWING STICK, UNALASKA.

Collected by United States Fish Commission.

Cat. No. 175825, U.S.N.M.

of iron. It is impossible to conceive of a more excellent illustration of the fading out of an ancient primitive form and the gradual introduction of new elements.

The bone foreshaft (Cat. No. 72403, U.S.N.M.) of a large whaling or walrus harpoon from Bristol Bay is shown in fig. 92. It is the last expression in the use of modern tools for the preparation of a very ancient device. If this be compared with the gash in the end of the Fuegian harpoon, it will be seen that great progress has been made at this particular point. The upper part is carefully turned and the lower part cut with a tenon, so formed that when placed at the end of the shaft the strain in every direction is provided for. Collected by Charles L. M. McKay.

CONCLUSION.

The harpoon is the most complicated of the devices invented by uncivilized peoples. In a hemisphere capable of awakening every kind of human wants and needs, furnishing an infinite variety of supplies to these from place to place, providing one sort of materials for the harpoon here and quite another sort there, inhabited by native tribes endowed with great range of genius, it would be expected that a universal weapon should take on every possible form. Just as the whale ship of yesterday, its friend and contemporary, has been replaced by the ship driven by steam, so the Eskimo at present kills the seal, the walrus, the whale, and the arctic land mammals with a rifle and explosive cartridges instead of the ancient harpoon. Should the Eskimo use his great weapon at all, it will be, as Murdoch shows, to retrieve his game on the edge of the ice after it is shot, and not as a killing device.

Both the ship and the harpoon served benevolent purposes, since they fostered and stimulated ingenuity until the fullness of time for steamships and firearms arrived. The harpoon is the climax of piercing inventions, which include daggers, lances, spears, javelins, and arrows of all kinds—held in the hand, hurled from the hand, either unaided or with the help of hand rest, amentum or atlatl, or shot from a bow. As was noted in the preceding drawings and descriptions, the harpoon had no limit in its application, being equally efficient on the land, in the air, in the water, or through the ice, at long range or short range, with short or long shaft, in some examples this part a hundred feet in length. The simplest forms have three rude parts; the most highly developed a score or more. Besides its own complexity, it has in the arctic area dominated the kaiak in its upper part, as well as the dress of the man, and called forth any number of accessories for decoying, finding, watching, taking out of the water, and carrying home.

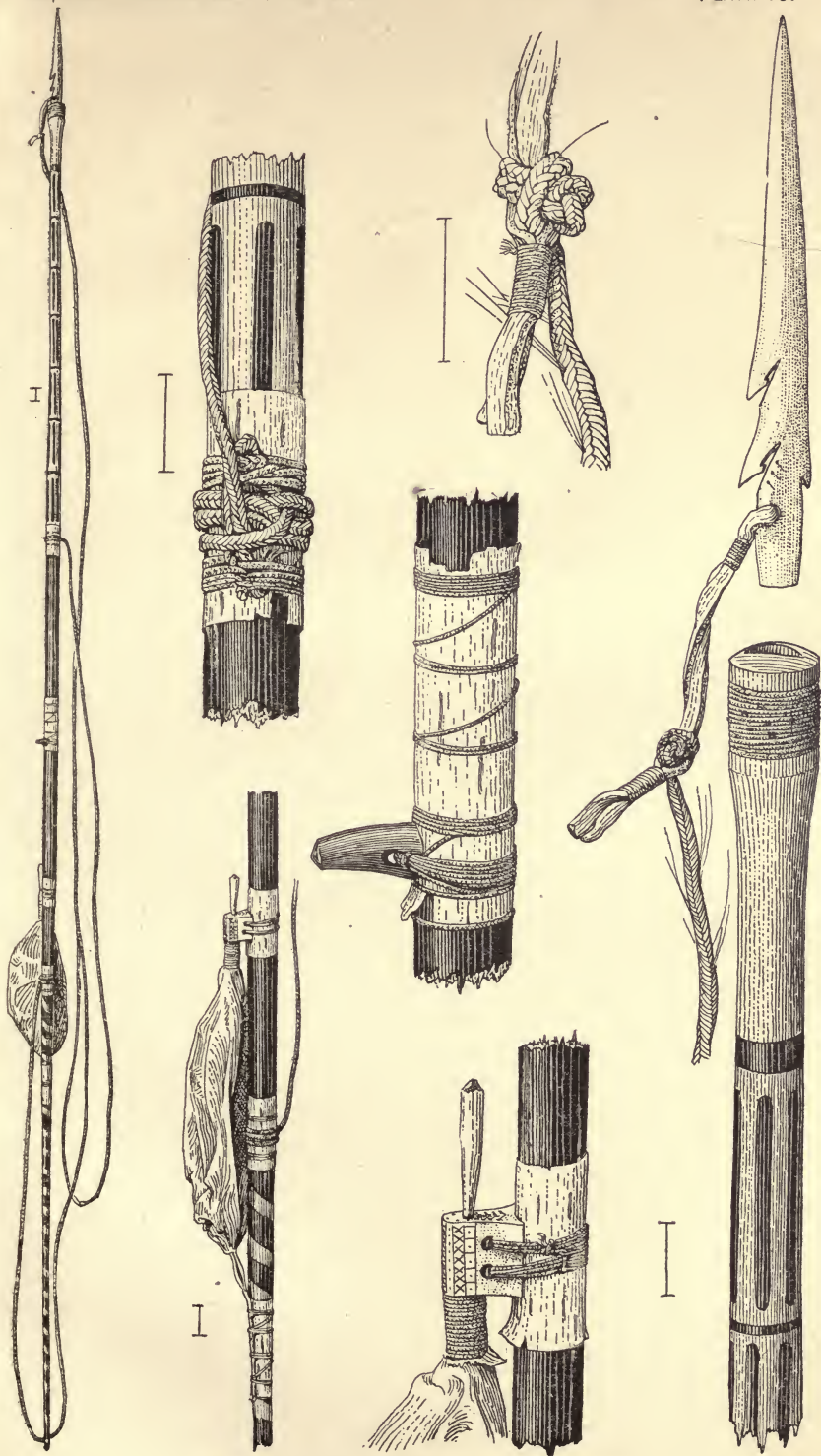
When it is remembered that every part of this complex apparatus

must be most efficacious for its region and quarry, and not bulky, one is not astonished to find a great variety of patterns in the structure and in the knots on the lines. The Eskimo themselves were not all agreed on these points. Hence, for example, Murdoch discusses the question whether the blade of the toggle head should be in the plane of the line hole or across it. Again, the length of the shaft and other characteristics were, in certain limits, fitted to the hunter. One has only to look through Nelson's plates to be convinced that there was a range of individual choice in many parts. While, therefore, it is correct to say that all harpoons of the different types resemble one another in the same area, it is equally proper to add that no two harpoons are alike.

Besides the lesson in the history of invention which this study affords, other questions arise. What help do these technical specimens offer to the ethnologist and the archæologist in deciding race, language, migrations, and antiquity? Can it be said of a harpoon, or some of its parts, found without label in a collection, that it was made by this or that tribe, or that it came from a certain area? Or, if in a shell heap or village site or grave certain harpoon parts are found, will a comparison with the drawings or descriptions in this paper tell who the makers of these relics might have been? In the first place, if the technical products of peoples now living are to throw light upon ethnic and archæologic investigations, these products must be collected in large numbers and the identity of those who made and used them must be settled beyond controversy. With reference to precious material gathered after the discovery and scattered in private and public collections, it is safe to label them as to tribe and locality by the help of specimens lately acquired by scientific collectors. In this way the mouths of these dumb witnesses will be opened. It must not be forgotten, however, that unity of race is a matter of blood, of kinship; that unity of speech is a matter of lip and ear, and requires some close contact; while unity of industry is a matter of eye and hand and may be easily communicated from afar.

On the question, how much of all this invention is of native growth and what proportion is exotic, wide differences of opinion still exist.

To begin with, all iron and all work of iron are in a sense new, added, accultural; not out and out, but in varying proportion and for the most part merely substitutional. The iron blade takes the place of a stone blade only as a better stone. It is hammered and ground similarly. The simple tools alter shapes but little; they merely cut, saw, grind, and pierce better than the old. But a more vigorous substitution took place in the barter of devices between savage tribes widely separated, but made acquainted, first in their own commerce, and afterwards by the fishing and fur trading interests of the white settlers.



BARBED HARPOON WITH FLOAT, KADIAK, ALASKA.

Collected by Vincent Collyer.

Cat. No. 11362. U.S.N.M.

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